CALIFORNIA
ENERGY
COMMISSION

NATURAL GAS REVIEW AND FORECAST DATABOOK

Western Interstate Energy Board
Natural Gas Study

DATABOOK
DRAFT

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Arnold Schwarzenegger, *Governor*

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North American Natural Gas Production

The study undertaken by the California Energy Commission covers the North American natural gas market. This requires the development of a data base for the natural gas resources and production for the contiguous United States, Alaska, Canada, Mexico, and liquefied natural gas imports. The emphasis of the work is on the Western United States and Canada as defined by the Western Interstate Energy Board (WIEB). The WIEB study region includes:

- Alaska, Arizona, California, Colorado, Idaho Montana, Nebraska, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming,
- Alberta, British Columbia, and Saskatchewan, and
- Northern Mexico.

The North American natural gas industry is currently producing 27.1 Trillion cubic feet (Tcf) of dry natural gas, **Figure P-1 North America Natural Gas Production**. Natural gas production can be reported as gross production, wet gas, marketed production or dry gas production.

Gross production is the measure of all gases that flow from the producing wells prior to any venting, flaring and/or reinjection of the natural gas.

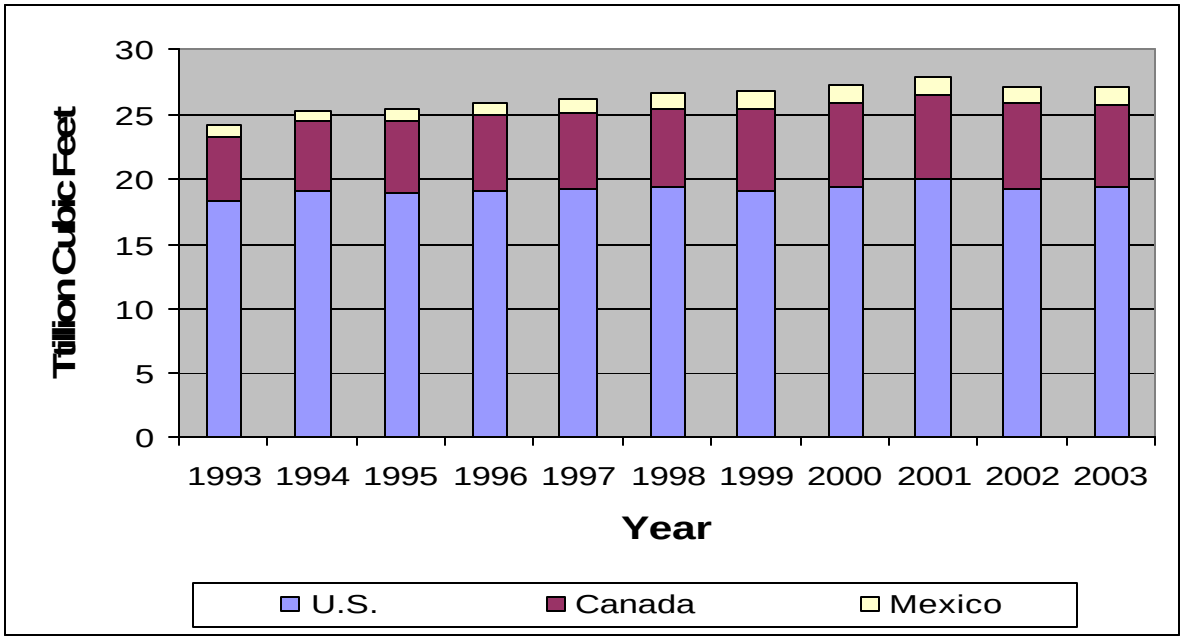
Wet natural gas is a mixture of hydrocarbon compounds and small quantities of various nonhydrocarbons existing in the gaseous phase or in solution with crude oil in porous rock formations at reservoir conditions. The principal hydrocarbons normally contained in the mixture are methane, ethane, propane, butane, and pentane. Typical nonhydrocarbon gases that may be present in reservoir natural gas are water vapor, carbon dioxide, hydrogen sulfide, nitrogen and trace amounts of helium.

Marketed production is the amount of natural gas produced after accounting for vented or flared natural gas and the reinjection of the produced gas back in to the reservoir.

Over the past decade natural gas production has grown from 24.1 Tcf to 27.1 Tcf, this represents an annual increase of approximately one percent. The United States is the largest producer of natural gas in the region producing approximately 73 percent of the total North American production over the past decade. Canada's natural gas production represents approximately 23 percent of the market with Mexico at 4 percent.

The North American natural gas market is essentially self-sufficient. The United States does import natural gas in the form of liquefied natural gas (LNG). In 2004, the United States imports of LNG were 652 Billion cubic feet (Bcf). This is less than two percent of the North American natural gas supply. The United States also export a small quantity of natural gas to Japan in the form of LNG. In 2003, the United States exports were 64 Bcf.

Figure P-1: North America Natural Gas Production



Source: Energy Information Administration.

Concern has been raised about the ability of the North American natural gas supply to expand production to meet the increased demand for natural gas. This concern has been caused by the fact that natural gas production has remained flat over the last four years, **Table P-1: North America Natural Gas Supply, Trillion Cubic Feet (Tcf)**. During the 1990's Canada was able to increase its production significantly while the United States production was fairly static. Since 2000, Canada's production has level off averaging approximately 6.5 Bcf.

Table P-1: North America Natural Gas Supply, Trillion Cubic Feet (Tcf)

	Production				Import/Export (LNG)	
Year	**Canada**	**Lower 48**	**Mexico**	**Alaska**	**Imports**	**Exports**
1991	4.058	15.319	0.899	2.379	0.000	0.054
1992	4.520	15.214	0.879	2.626	0.000	0.053
1993	4.910	15.317	0.950	2.778	0.000	0.056
1994	5.266	15.735	0.975	3.086	0.000	0.063
1995	5.603	15.229	0.957	3.370	0.000	0.065
1996	5.711	15.480	1.064	3.374	0.000	0.068
1997	5.762	15.521	1.166	3.381	0.045	0.062
1998	5.976	15.645	1.266	3.379	0.000	0.066
1999	6.265	15.470	1.287	3.362	0.163	0.064
2000	6.470	15.653	1.314	3.529	0.226	0.066
2001	6.597	16.248	1.302	3.428	0.238	0.066
2002	6.633	15.570	1.334	3.477	0.229	0.063
Annual Growth Rates	3.05%	0.16%	3.45%	2.27%	8.77%	6.44%

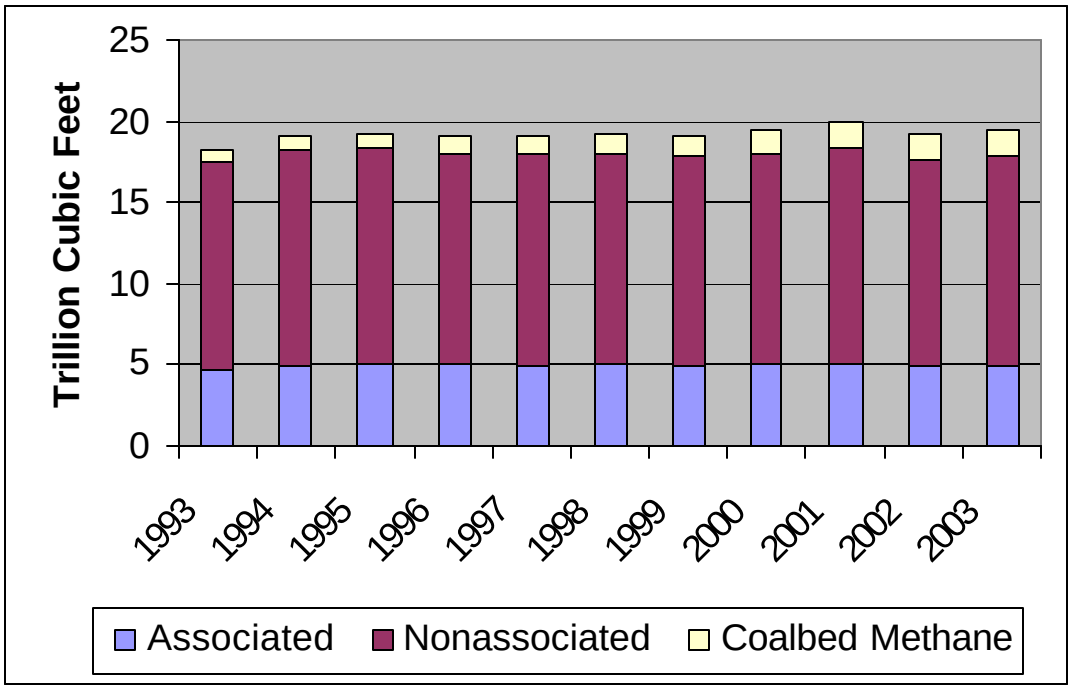
Source: Energy Information Administration

United States

Natural gas supply is composed of associated gas, nonassociated gas and coalbed methane production. Associated natural gas production is the natural gas production associated with production from oil wells. Nonassociated natural gas is production from natural gas wells. Coalbed methane is the production of natural gas contained in coalbeds. In 2003, 26 percent of the United States production was associated gas, 67 percent nonassociated gas, and 7 percent from coalbeds.

The United States domestic production has been relative flat over the decade, **Figure P-2: United States Natural Gas Production** going from 18.4 Tcf in 1993 to 19.4 Tcf in 2003. It is expected that this trend will continue as many of the major natural gas production fields have matured and are experiencing declining production. Over the last three years the United State's natural gas production per well (thousand cubic feet per day per well) has fallen by 8.6 percent. During this same period the number of natural gas wells has increased 5.4 percent.

Figure P-2: United States Natural Gas Production



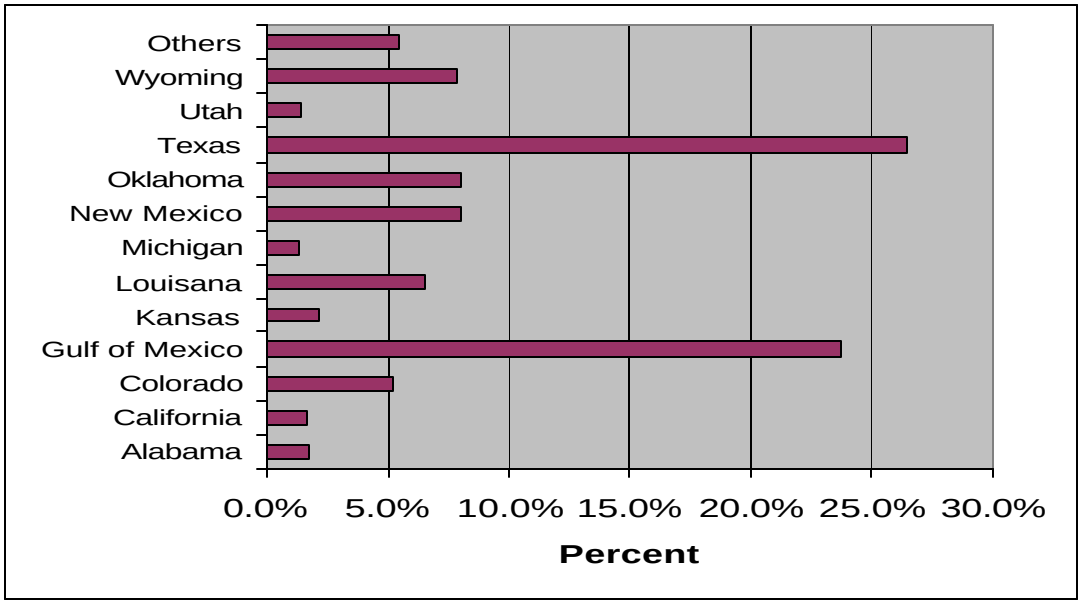
Source: Energy Information Administration

The United States has been able to maintain the current level of natural gas production by increasing the number of producing wells through new development and infill drilling. Technology advancements have been another major reason that has allowed the United States to maintain the current level of natural gas production. This has been through the use of new well fracturing techniques and horizontal drilling. This has increased well productivity and has allowed production from reservoirs that would not be productive under past completion practices. This new technology has also allowed the production of natural gas from coal beds.

Coalbed methane production (CBM) has helped the United States to maintain the current level of natural gas production. In 2003 CBM production was 1.6 Tcf.

The major natural gas producing areas in the United States are located in Texas and the Gulf of Mexico, **FigureP-3: United States Natural Gas Production**. Production from Texas and the Gulf of Mexico accounted for approximately 50 percent of our domestic production.

Figure P-3: United States Natural Gas Production



The WIEB region of the Western United States is a major contributor to our domestic natural gas production, **Table P-2: United States Natural Gas Gross Withdrawals and Production By States, Million of Cubic Feet**. States located in the WIEB area accounted for approximately 21 percent of the production. The 21 percent does not include production from Alaska since; the infrastructure does not exist to allow this production to participate in the North American natural gas market.

Canada

Canada natural gas production has increased at an annual rate of 3 percent over the last ten years, **Table P-1**. Concern has developed in recent years that natural gas production in Canada may have peaked.

Alberta, British Columbia, and Saskatchewan are the major natural gas producers in the country. Production from these three provinces in 2002 was 6.4 Tcf. This represents 97 percent of the country's total natural gas production. Alberta is the largest producer accounting for 76 percent of the Canada's natural gas production.

The production from these provinces is a major portion of Canada's natural gas supply and a significant source of natural gas for the United States. Canada's exports approximately 3.5 Tcf to the United States. This accounts for over 10 percent of the United States natural gas supply.

Table P-2: United States Natural Gas Production By States, Million Cubic Feet (MMcf)

	Nonassociated Production				Associated Production				
States	**Onshore**	**Offshore State**	**Offshore Federal**		**Onshore**	**Offshore State**	**Offshore Federal**		**Total**
Alabama	178,698	202,002			5,802				386,502
Arizona	300								300
Arkansas	147,734				14,388				162,122
California	88,969		3080		233,169	7068	64735		397,021
Colorado	730,945				118,991				849,936
Florida					3,785				3,785
Illinois	174				5				179
Indiana	1,309								1,309
Kansas	401,396				54,738				456,134
Kentucky	88,259								88,259
Louisiana	1,156,657	125,481			88,613	11,711			1,382,462
Maryland	22								22
Michigan	224,112				56,028				280,140
Mississippi	142,070				5,344				147,414
Montana	76,053				10,371				86,424
Nebraska	106				1,736				1,842
Nevada					6				6
New Mexico	1,432,966				222,940				1,655,906
New York	36,637				179				36,816
North Dakota	15,130				44,848				59,978
Ohio	97,154				6,004				103,158
Oklahoma	1,445,916				105,356				1,551,272
Oregon	837								837
Pennsylvania	157,800								157,800
South Dakota	531				9,894				10,425
Tennessee	0				2,050				2,050
Texas	4,773,516	54,672			830,425	2,391			5,661,004
Utah	260,554				32,509				293,063
Virginia	76,915								76,915
West Virginia	190,249								190,249
Wyoming	1,572,728				174,748				1,747,476
Gulf of Mexico			3,850,708				858,332		4,709,040
Alaska	91,226	102,972			3092631	190608			3,477,437
Total United States	13,388,963	485,127	3,853,788		5,114,560	211,778	923,067		23,977,283

Source: Energy Information Administration

North American Natural Gas Resources

Natural gas resources are classified as proven (conventional or unconventional), and undiscovered (conventional or unconventional). Proven natural gas resources (may be referred to as natural gas reserves when the resource is being produced) are estimated natural gas reserves that analysis of geologic and engineering data demonstrates with reasonable certainty are recoverable under existing economic and operating conditions.

Undiscovered natural gas resources are natural gas resources yet to be discovered, that are estimated to exist in favorable geologic settings and are not associated with the growth of existing field reserves. The undiscovered resources are based on current technology but the resources may not be economically viable under current market prices and/or production costs.

Conventional natural gas resources are those resources occurring as discrete accumulations in structural or stratigraphic geologic traps. The challenge to define conventional resources is primarily in discovering the reservoirs that contain the resource once found production of these reserves (structures or stratigraphic traps) is relatively easy.

Unconventional natural gas resources normally are in basins where the continuous accumulations are much larger than conventional accumulations. The natural gas is held in place by low permeability (the ability of the formation to allow flow) in the host formation and/or high water saturation. Four types of natural gas resources are currently considered unconventional: coalbed methane (CBM), shale gas, tight gas and gas hydrates. These resources may be relatively easy to find, in some instances, however production of the natural gas is more challenging and expensive than conventional gas.

The National Petroleum Council (NPC) estimated the natural gas resources for North America at 1,969 trillion cubic feet (Tcf), **Table R-1: North American Natural Gas Resources, Trillion of Cubic Feet (Tcf)**. The 1,969 Tcf of natural gas resources as estimated can be recovered with present technology. Due to costs or production rates, some of the resources may not be economically recoverable at the present time.

The United States has the largest portion of the resources at 64 percent. In **Table R-1** the row Growth in Proven reserves is based on production experience. History has shown that the recoverable resource estimates for proven reserves tend to increase over time. This growth in proven reserves occurs as the field developers gain additional data from production history, drilling associated with field development and expansion, and the development of new technology.

Figure R-1: Natural Gas Resource Basins for the United States, Canada and Mexico indicates the areas from which natural gas is being produced or may contain natural gas resources that could result in successful exploration efforts in finding new natural gas fields. **Figure R-2: Reserves of Major WIEB Natural Gas Supply Basins** indicates the proven and potential natural gas resources in the WIEB Region.

Table R-2, Proven Natural Gas Reserves (Wet After Lease Separation), Billion Cubic Feet (Bcf) indicates the proven natural gas resources in the United States. **Table R-2** is

based on estimated wet gas reserves. These reserves are comparable with the NPC estimates of proven dry gas resources when the nonhydrocarbon gases are removed and natural gas liquids are extracted (ethane, propane, butane, and pentane). As shown in **Table R-2** the WIEB states have approximately 32 percent of the United State's proven resources. Wyoming, New Mexico and Colorado are the major holders of the western states natural gas resources.

The western states are also a major source of unconventional natural gas production and reserves. These resources are in the form of coalbed methane, **Table R-3, Coalbed Methane Reserves, Billion Cubic Feet (Bcf)**. The WIEB states have approximately 80 percent of the proven coalbed methane resources in the United States.

Table R-1, North American Natural Gas Resources, Trillion of Cubic Feet (Tcf)

	United States	**Canada**	**Mexico**
Proved Reserves	183	60	28
Growth in Proved Reserves	241	68	22
Total Discovered Remaining	425	128	51
Undiscovered Conventional Potential	9,687	219	70
Undiscovered Nonconventional Potential	339	50	0
Total Undiscovered Potential	1,027	269	70
Total Technical Resources	1,454	397	121

Source: National Petroleum Council North American Technical Resource Base

Figure R-1: Natural Gas Resource Basins for the United States, Canada and Mexico

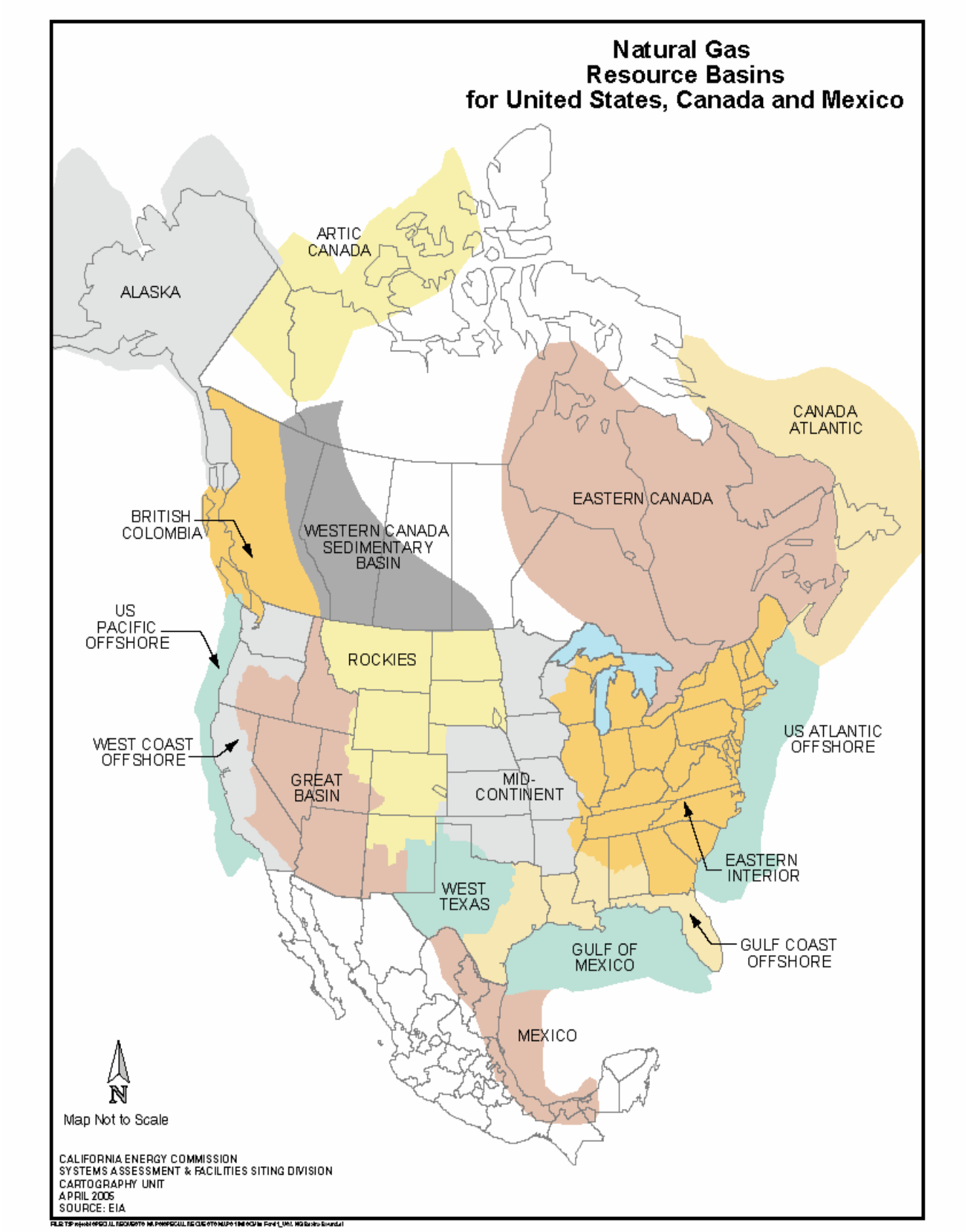


Figure R-2: Reserves of Major WIEB Natural Gas Basins

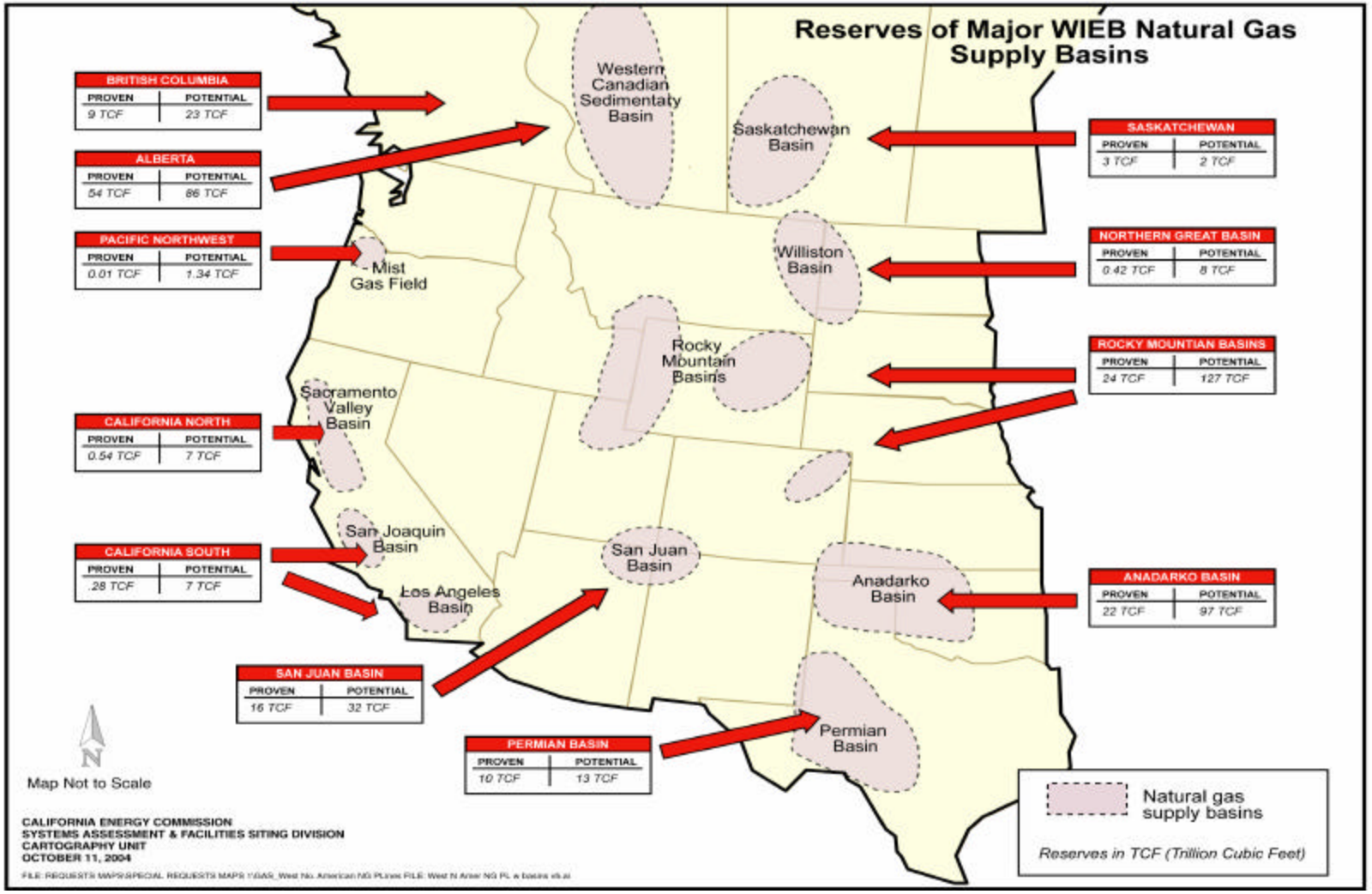


Table R-2, Proven Natural Gas Reserves (Wet After Lease Separation)[1] Billion Cubic Feet (Bcf)

State and Subdivision	Nonassociated Reserves		Associated Reserves		Total Reserves	Percent of Reserves
Alaska	2,157		6,376		8,533	4.4%
Lower 48 States	**163,863**		**23,165**		**187,028**	
Alabama	3,891		31		3,922	2.0%
Arkansas	1,616		38		1,654	0.8%
California	*796*		*1,900*		*2,696*	*1.4%*
Federal Offshore (California)	*56*		*459*		*515*	*0.3%*
Colorado	*13,251*		*1,097*		*14,348*	*7.3%*
Florida	0		102		102	0.1%
Kansas	5,263		66		5,329	2.7%
Kentucky	1,974		25		1,999	1.0%
Louisiana	8,520		670		9,190	4.7%
Federal Gulf of Mexico (Louisiana)	12,749		6,364		19,113	9.8%
Michigan	3,097		214		3,311	1.7%
Mississippi	713		33		746	0.4%
Montana	*820*		*94*		*914*	*0.5%*
New Mexico	*16,971*		*1,482*		*18,453*	*9.4%*
New York	315		0		315	0.2%
North Dakota	209		315		524	0.3%
Ohio	772		346		1,118	0.6%
Oklahoma	14,576		1,177		15,753	8.1%
Pennsylvania	2,088		137		2,225	1.1%
Texas	41,104		6,387		47,491	24.3%
Federal Gulf of Mexico (Texas)	4,967		1,267		6,234	3.2%
Utah	*3,915*		*359*		*4,274*	*2.2%*
Virginia	1,673		0		1,673	0.9%
West Virginia	3,477		21		3,498	1.8%
Wyoming	*20,970*		*561*		*21,531*	*11.0%*
Miscellaneous[a]	80		20		100	0.1%
US Total	**166,020**		**29,541**		**195,561**	
WIEB Total in U.S.	**56,779**		**5,952**		**62,731**	**32.1%**

a Includes Arizona, Illinois, Indiana, Maryland, Missouri, Nebraska, Nevada, Oregon, South Dakota, and Tennessee.

Source: Energy Information Administration

[1] The removal of natural gas liquids from the wet gas will result in a volume decrease in the natural gas volume of 4.8 to 4.2 percent. This volume would represent the proven dry natural gas reserves.

Table R-3, Coalbed Methane Reserves, Billion Cubic Feet (Bcf)

	Alabama	Colorado	New Mexico	Utah	Wyoming	Eastern States[a]	Western States[b]	Others[c]	United States
1992	1,968	2,716	4,724	NA	NA	NA	NA	626	10,034
1993	1,237	3,107	4,775	NA	NA	NA	NA	1,065	10,184
1994	976	2,913	4,137	NA	NA	NA	NA	1,686	9,712
1995	972	3,461	4,299	NA	NA	NA	NA	1,767	10,499
1996	823	3,711	4,180	NA	NA	NA	NA	1,852	10,566
1997	1,077	3,890	4,351	NA	NA	NA	NA	2,144	11,462
1998	1,029	4,211	4,232	NA	NA	NA	NA	2,707	12,179
1999	1,060	4,826	4,080	NA	NA	NA	NA	3,263	13,229
2000	1,241	5,617	4,278	1,592	1,540	1,399	41	--	15,708
2001	1,162	6,252	4,324	1,685	2,297	1,453	358	--	17,531
2002	1,283	6,691	4,380	1,725	2,371	1,488	553	--	18,491
2003	1,665	6,473	4,396	1,224	2,759	1,528	698	--	18,743

[a] Includes Ohio, Pennsylvania, Virginia, and West Virginia.

[b] Includes Arkansas, Kansas, Montana, and Oklahoma.

[c] Includes Oklahoma, Pennsylvania, Utah, Virginia, West Virginia, and Wyoming; these states are individually listed or grouped in Eastern States and Western States for 2000-2003.

NA = Not available.

Source: Energy Information Administration, Office of Oil and Gas

PRODUCTION PROFILES FOR THE UNITED STATES AND CANADA
STATES AND PROVINCES

Production WIEB Region

Natural gas production from the WIEB area totaled 11.5 trillion cubic feet (Tcf), this was approximately one third of the natural gas production from both Canada and United States in 2002, **Table P-3, WIEB Natural Gas Production, Million Cubic Feet**.

The western states that make up the WIEB region produced approximately 21 percent of the United States natural gas production. The Canadian province's natural gas production accounts for 96 percent of Canada's natural gas production. The majority of the natural gas production in the WIEB region occurs in Alberta, British Columbia, Wyoming and Colorado.

Natural gas production information for the years 1992 through 2002 for the Western States and Canadian Provinces have been included for review.

Table P-3, WIEB Natural Gas Production in 2002, Million Cubic Feet

	ASSOCIATED	NONASSOCIATED	CBM	TOTALS	PRODUCTION AS PORTION OF		
	(MMCF)	(MMCF)	(MMCF)	(MMCF)	WIEB	US	Canada
United States							
Arizona		300		300	0.003%	0.001%	
California	304,973	94,791		399,764	3.493%	1.670%	
Colorado	118,991	210,946	520,000	849,937	7.426%	3.550%	
Montana	10,371	76,055		86,426	0.755%	0.361%	
New Mexico	222,942	961,967	471,000	1,655,909	14.468%	6.917%	
Nebraska	288	904		1,192	0.010%	0.005%	
Oregon	0	836		836	0.007%	0.003%	
Nebraska	288	904		1,192	0.010%	0.005%	
Nevada							
Utah	32,509	157,554	103,000	293,063	2.560%	1.224%	
Wyoming	174,749	1,270,727	302,000	1,747,476	15.268%	7.299%	
U.S. Total Production	17,794,858	4,532,420	1,614,000	23,941,279			
Canada							
Alberta	516,989	4,448,696	0	4,965,685	43.385%		74.897%
British Columbia	46,000	1,104,000	0	1,150,000	10.048%		17.345%
Saskatchewan	54,465	239,357	0	293,822	2.567%		4.432%
Canada Total Production				6,630,000			
Total WIEB Production				11,445,602	100.00%	48.05%	

Arizona-Natural Gas Production

In 2002, Arizona's natural gas production was 300 million cubic feet (MMcf). This represents approximately 3/1000 of one percent of the WIEB region's production and 1/1000 of one percent of the United States overall production. Arizona's natural gas production came mainly from nonassociated gas, as there was no production in the associated and coalbed methane categories.

Between 1992 and 2002, Arizona's natural gas production decreased at a rate of 9.3 percent per year. Arizona experienced the highest production during year 1992 and 1994 in nonassociated gas and a spike in production in 1993 from associated gas. After 1994, the state experienced a steady decline in production.

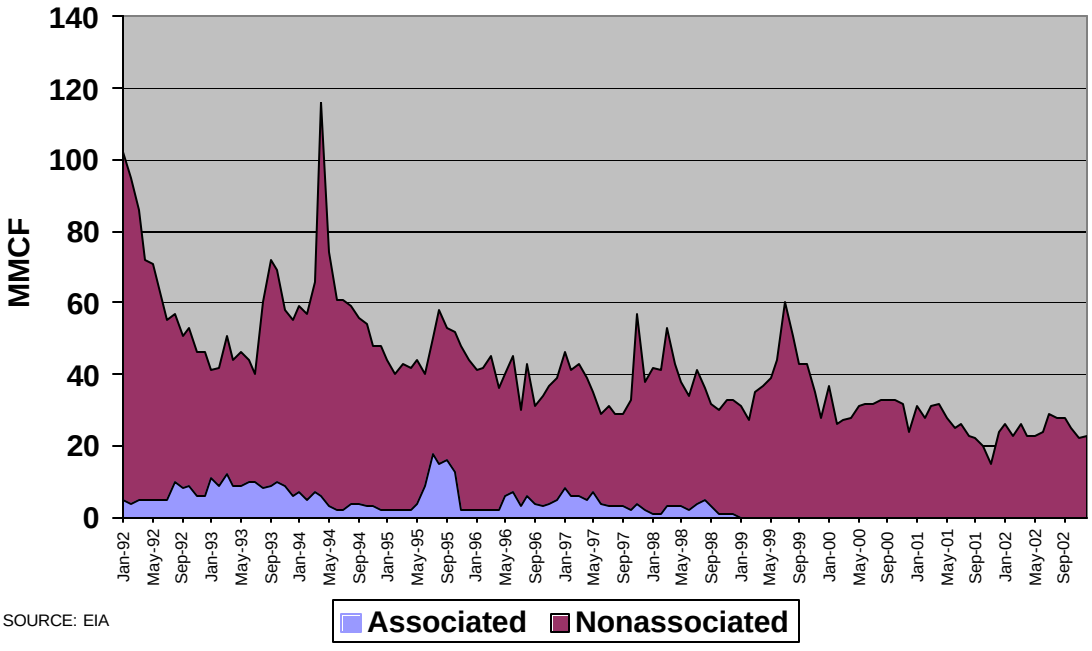
From 1992 to 1994 there was no change in natural gas producing wells (nonassociated and coalbed methane). However, from 1995 to 2000, wells increased from six to nine, and from 2000 to 2002, they decreased by two wells to seven.

Arizona's production per well is following the trend seen in most areas. The annual production per well has fallen at a rate of 9.8 percent. The number of wells operating in Arizona, are in the single digits and therefore could cause some of the anomalies noted in the production per well per day column as well as in the efficiency graph where two spikes appear in the years 1992 and 1994.

Years	Associated [2] (MMCF)	Nonassociated (MMCF)	CBM (MMCF)	Totals (MMCF)	Non associated And CBM Wells	Production Per Well Per Day (MCF)
1992	73	723	0	796	6	330
1993	112	510	0	622	6	233
1994	48	711	0	759	6	325
1995	87	471	0	558	7	184
1996	46	417	0	463	7	163
1997	53	397	0	450	8	136
1998	28	428	0	456	8	147
1999	0	473	0	473	8	162
2000	0	368	0	368	9	112
2001	0	305	0	305	8	104
2002	0	300	0	300	7	117
Annual Growth Rates from 1992 to 2002 for each of the categories above						
	-100.00%	-8.42%	0.00%	-9.30%	1.55%	-9.82%

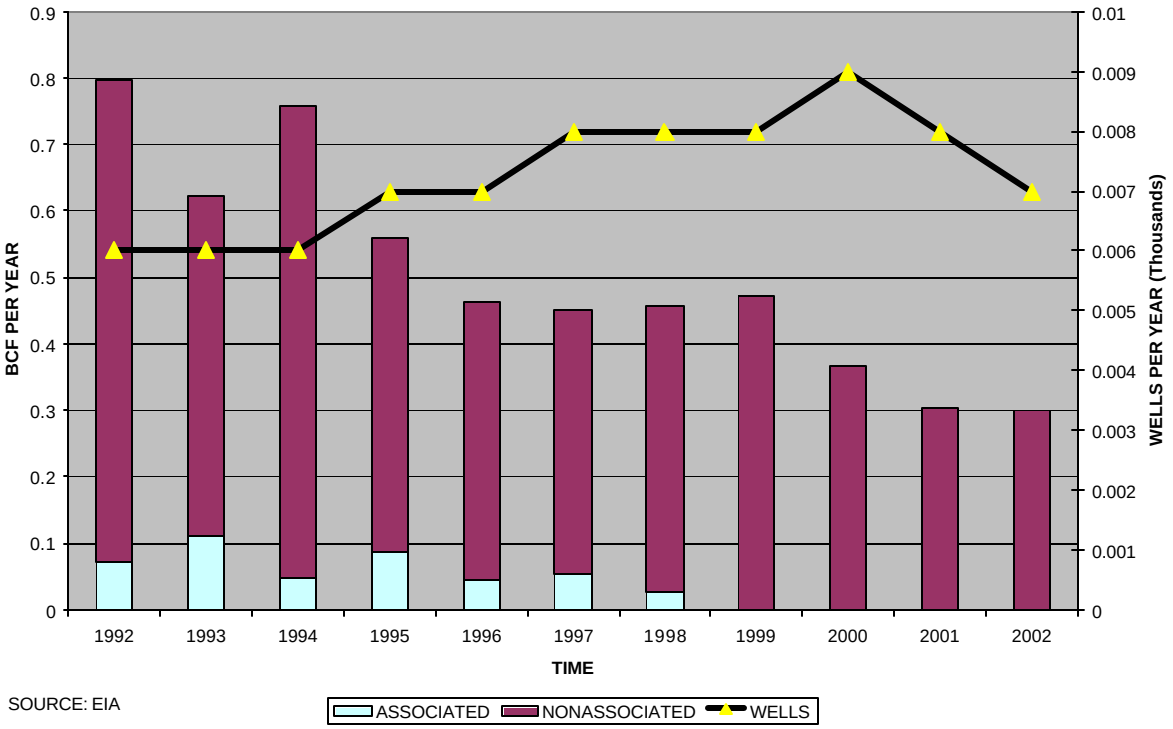
[2] Annual production is in million cubic feet (MMCF) and the production per well per day is in thousand cubic feet (MCF).

ARIZONA NATURAL GAS PRODUCTION

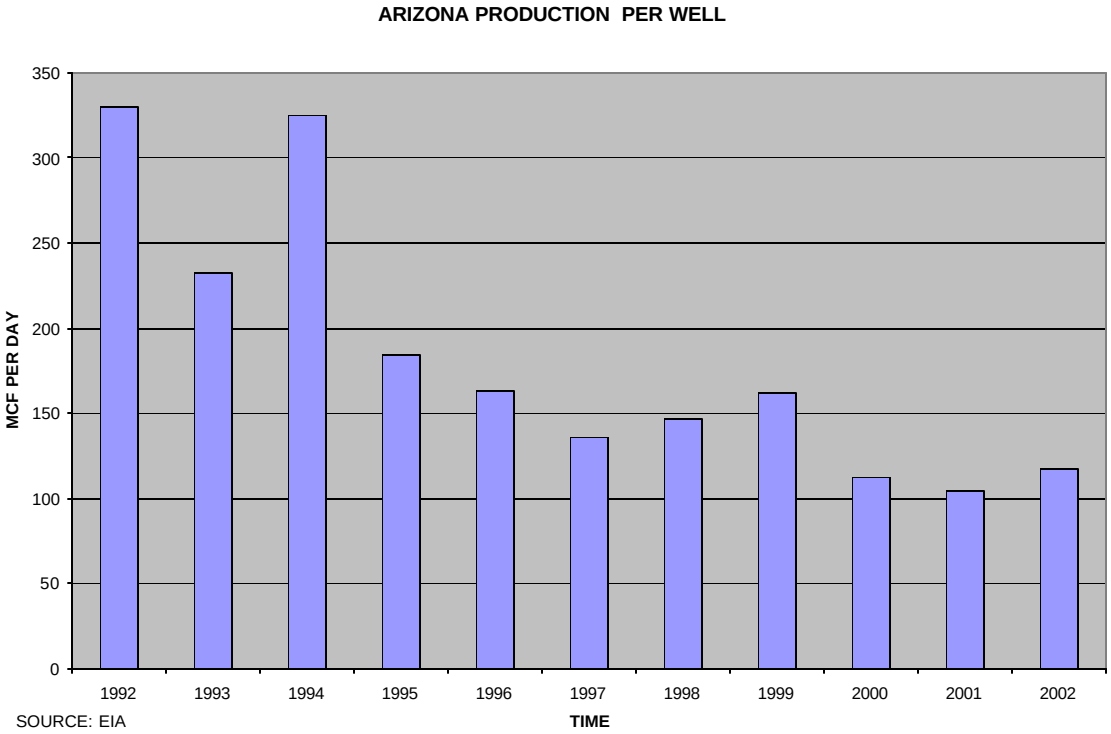


SOURCE: EIA

ARIZONA PRODUCTION BY GAS TYPE / WELL COUNT



SOURCE: EIA


ARIZONA PRODUCTION PER WELL
350
300
250
200
150
100
50
0
MCF PER DAY
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME

SOURCE: EIA

California-Natural Gas Production

In 2002, California's natural gas production totaled 400 billion cubic feet (Bcf). This production came mainly from associated and nonassociated sources of gas. No coalbed methane production exists in California. From 1992 to 1995, production had fallen from 449 Bcf to 383 Bcf, before recovering to 432 Bcf in 1999 and there after steadily declining to the 2002 level of 400 Bcf. Production declined at the rate of 1.2% annually from 1992 to 2002. Total gas production in California represents approximately 3.5% of the WIEB region's production and approximately 1.7% of the United States' overall production.

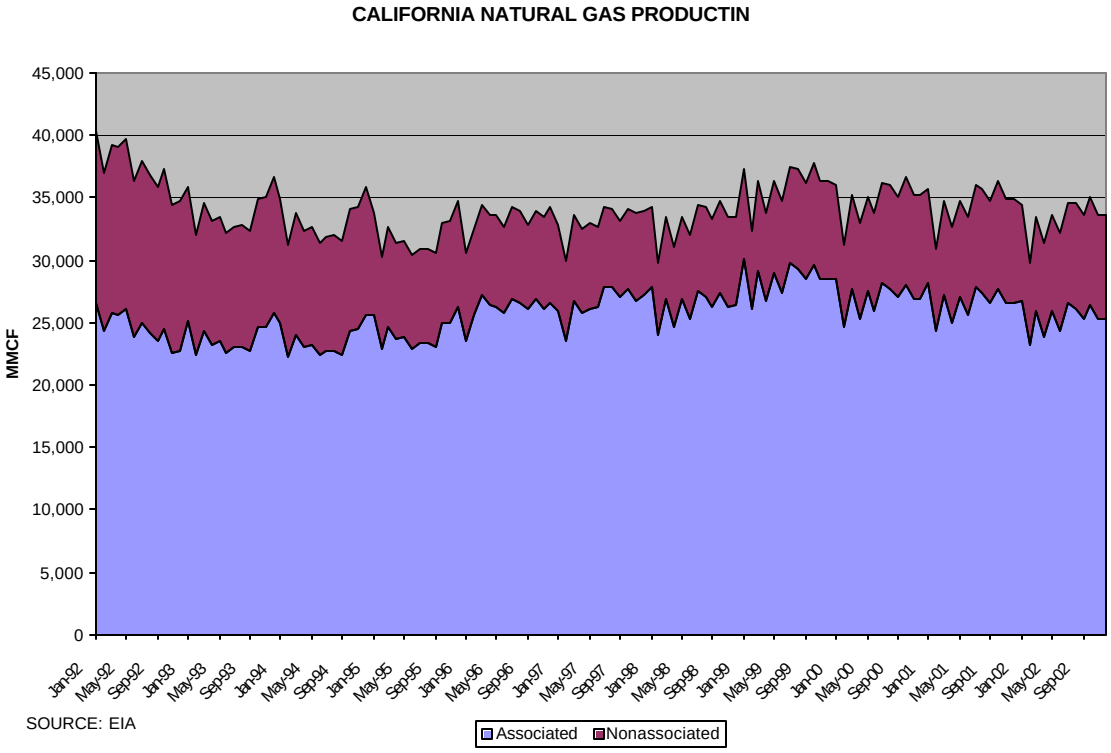
From 1992 to 2002, associated gas production increased approximately 0.3% per year while the nonassociated gas production decreased at the rate of 4.7% per year.

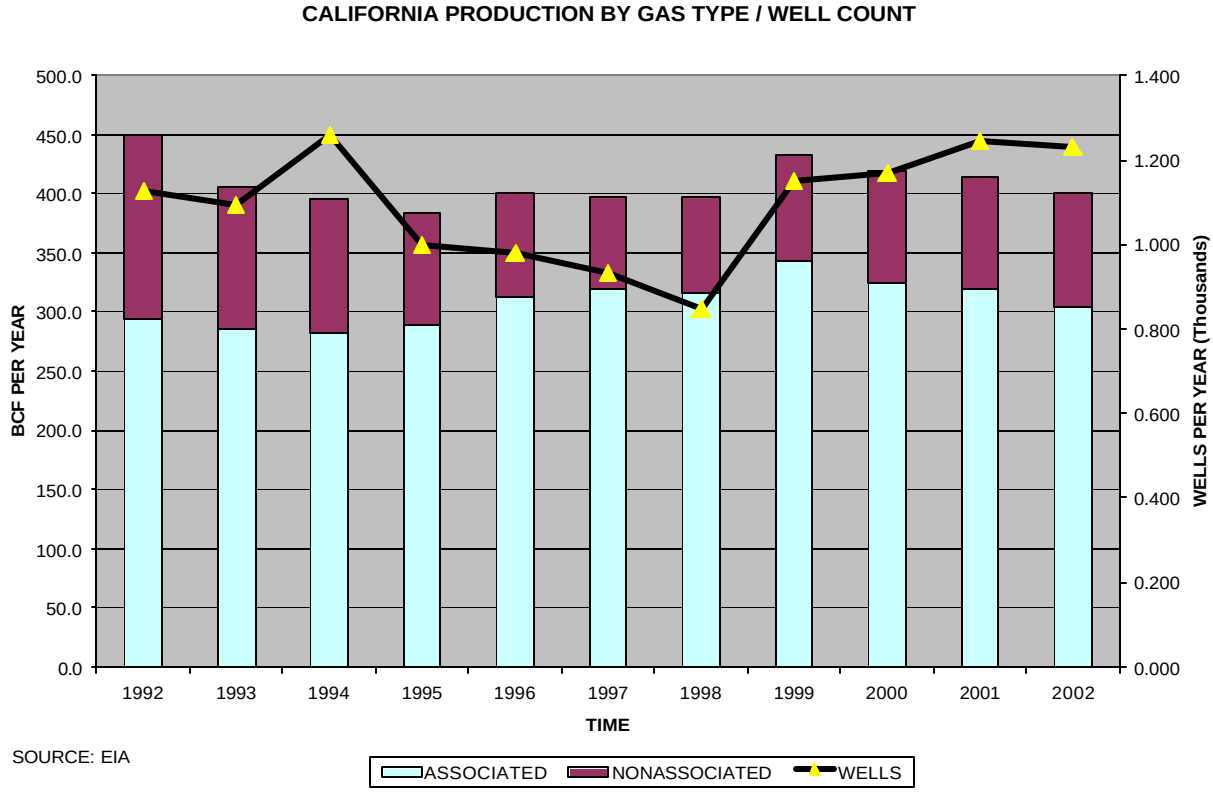
The well count increased from 1,126 in 1992 to 1,261 in 1994, and then declined from 1995 to 1998 from 997 to 847. From 1998 to 2002, the well counts increased approximately 50 percent from its 1998 level to 1,232. On an annualized basis, the well count has increased at a rate of approximately 0.9% per year from 1992 to 2002.

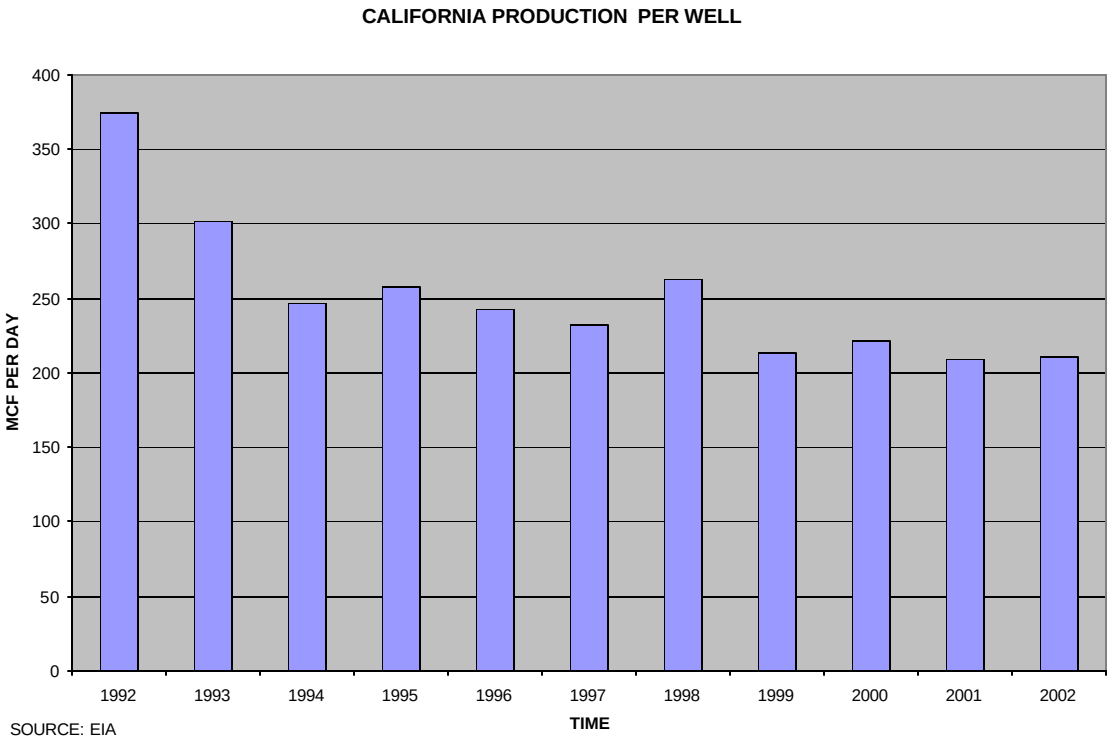
Efficiency of the wells in California, measured as production per well per day in thousands of cubic feet has declined steadily from 1992 to 2002 at a rate of 5.6% per year. The greatest rate of decline occurred from 1992 to 1994.

Years	Associated[3] (MMcf)	Nonassociated (MMcf)	CBM (MMcf)	Totals (MMcf)	Nonassociated and CBM Wells	Production Per Well Per Day (Mcf)
1992	294,800	154,057	0	448,857	1,126	375
1993	285,161	120,206	0	405,367	1,092	302
1994	282,226	113,525	0	395,751	1,261	247
1995	289,431	93,808	0	383,239	997	258
1996	313,579	86,429	0	400,008	978	242
1997	318,851	78,799	0	397,650	930	232
1998	316,474	81,097	0	397,571	847	262
1999	342,373	89,843	0	432,216	1,152	214
2000	324,401	94,464	0	418,865	1,169	221
2001	320,048	94,791	0	414,839	1,244	209
2002	304,973	94,791	0	399,764	1,232	211
Annual Growth Rates from 1992 to 2002 for each of the categories above						
	0.34%	-4.74%	0.00%	-1.15%	0.90%	-5.59%

[3] Annual production is in million cubic feet (MMCF) and the production per well per day is in thousand cubic feet (MCF).


CALIFORNIA NATURAL GAS PRODUCTIN
MMCF
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Jan-92
May-92
Sep-92
Jan-93
May-93
Sep-93
Jan-94
May-94
Sep-94
Jan-95
May-95
Sep-95
Jan-96
May-96
Sep-96
Jan-97
May-97
Sep-97
Jan-98
May-98
Sep-98
Jan-99
May-99
Sep-99
Jan-00
May-00
Sep-00
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
SOURCE: EIA
Associated
Nonassociated


CALIFORNIA PRODUCTION BY GAS TYPE / WELL COUNT
BCF PER YEAR
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
WELLS PER YEAR (Thousands)
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME
SOURCE: EIA
ASSOCIATED
NONASSOCIATED
WELLS


CALIFORNIA PRODUCTION PER WELL
MCF PER DAY
400
350
300
250
200
150
100
50
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME

SOURCE: EIA

Colorado-Natural Gas Production

In 2002, Colorado's natural gas production came in at 850 billion cubic feet (Bcf). This production came from associated, nonassociated, and coalbed methane sources. Associated gas production has increased at the annual rate of approximately 4.4% per year, nonassociated at the rate of 1.9% per year and coalbed methane at the rate of 20.3% per year. Overall production increased at the rate of 9.8% per year. The 2002 production of 850 Bcf represents 7.4% of the WIEB region's production and the United States' overall production of 3.6%.

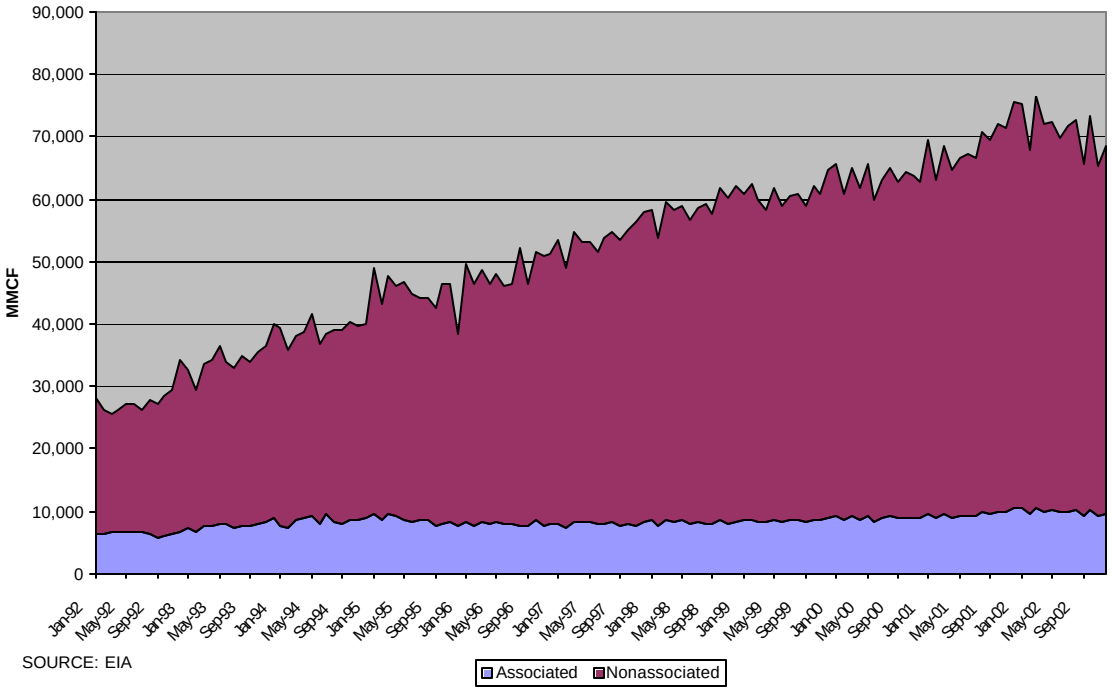
The well count in Colorado has increased at an annual rate of 14.8% per year. This is mainly due to the development of the coalbed methane resources. Production went from 82 Bcf of gas in 1992 to producing 520 Bcf in 2002 (an increase of about 534%).

On an annualized basis, Colorado's production per well per day has a decline rate of approximately of 3.3% from 1992 to 2002. During the time of 1992 to 1995, productivity increased from 119 Mcf per well per day to 171 Mcf per well per day. However, by 2002, it had dropped to 85 Mcf per well per day (a decrease of almost 50% from its 1995 level). This decline is the result of increased coalbed methane development. Coalbed methane production requires closer well spacing and normally the initial production is lower than nonassociated natural gas wells.

Years	Associated[4] (MMcf)	Nonassociated (MMcf)	CBM (MMcf)	Totals (MMcf)	Nonassociated and CBM Wells	Production Per Well Per Day (Mcf)
1992	77,568	174,426	82,000	333,994	5,912	119
1993	93,155	195,849	125,000	414,004	6,372	138
1994	101,379	186,651	179,000	467,030	7,056	142
1995	102,969	210,663	226,000	539,632	7,017	170
1996	95,723	214,292	274,000	584,015	8,251	162
1997	95,959	238,766	312,000	646,725	12,433	121
1998	98,459	205,349	401,000	704,808	13,838	120
1999	102,192	195,746	432,000	729,938	13,838	124
2000	106,431	202,782	451,000	760,213	22,442	80
2001	115,553	219,825	490,000	825,378	22,117	88
2002	118,991	210,946	520,000	849,937	23,554	85
Annual Growth Rates from 1992 to 2002 for each of the categories above						
	4.37%	1.92%	20.29%	9.79%	14.82%	-3.29%

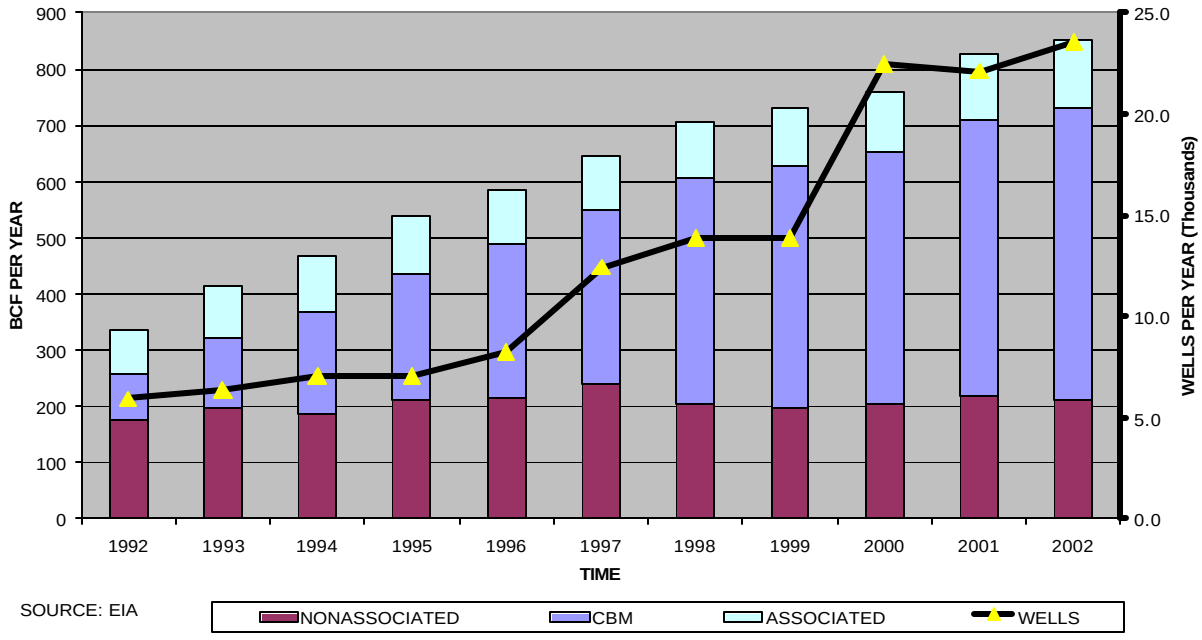
[4] Annual production is in million cubic feet (MMCF) and the production per well per day is in thousand cubic feet (MCF).

COLORADO NATURAL GAS PRODUCTION

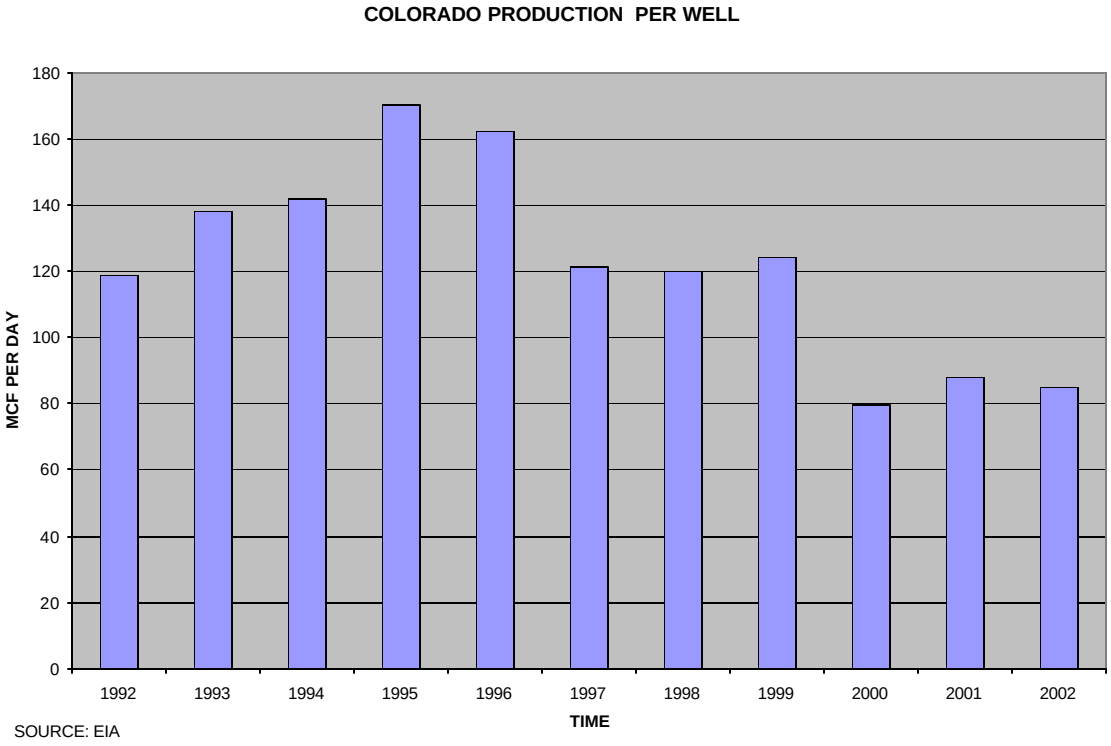


SOURCE: EIA

COLORADO PRODUCTION BY GAS TYPE / WELL COUNT



SOURCE: EIA


COLORADO PRODUCTION PER WELL
MCF PER DAY
180
160
140
120
100
80
60
40
20
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME

SOURCE: EIA

Montana-Natural Gas Production

In 2002, Montana produced 86 billion cubic feet (Bcf) of natural gas, of this, 10 Bcf came from associated sources, and the remaining 76 Bcf came from nonassociated sources. Montana has some coalbed production. The Energy Information Administration includes Montana's coalbed (CBM) production in the Western States classification that includes Arkansas, Kansas, Montana, and Oklahoma. It is not included in our calculations due to difficulty of trying to disaggregate these state's production and also due to CBM production for Montana being Statistically insignificant as portion of WIEB and the United States's overall production. The 86 Bcf produced, represents only 0.8% of the WIEB region's production and 0.4 % of the overall United States' production.

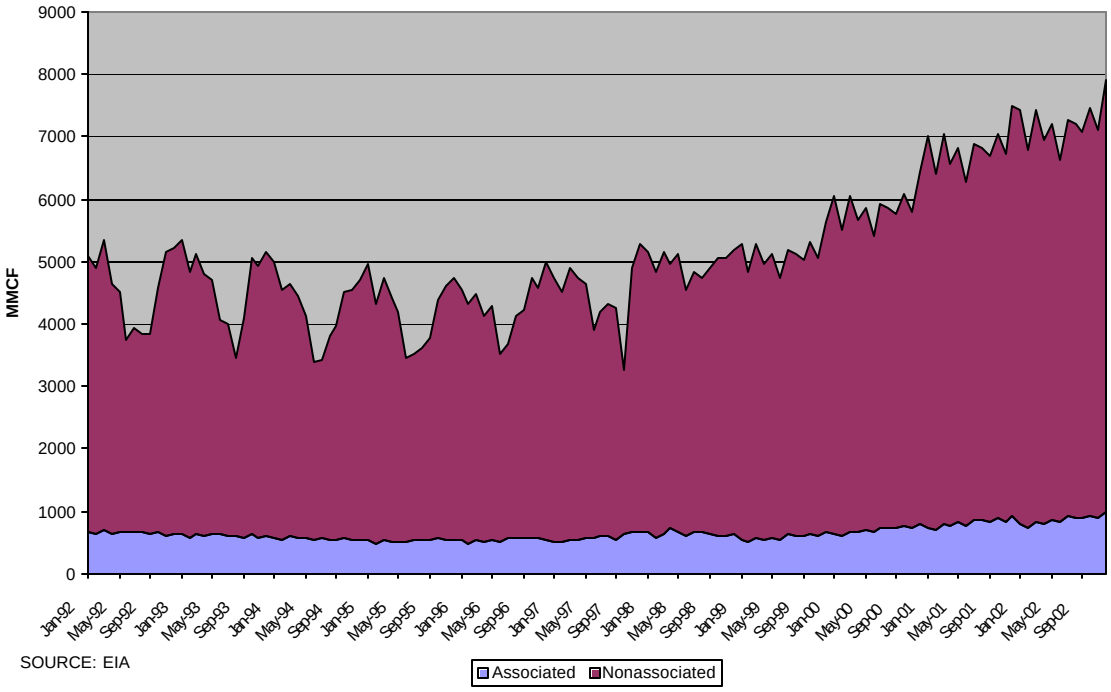
From 1992 to 2002, associated gas production increased at an annual rate of 2.8% per year and the nonassociated gas increased at a rate of 5% per year. Overall production increased at an annual rate of 4.7%.

The well count in Montana during the same time-period increased at a rate of 4.6% per year. But, productivity of the wells increased at a rate of 0.3% per year. The state's production gain is the result of an increasing number of wells coming online.

Years	Associated[5] (MMcf)	Nonassociated (MMcf)	CBM (MMcf)	Totals (MMcf)	Nonassociated and CBM Wells	Production Per Well Per Day (Mcf)
1992	7892	46918	0	54810	2,890	44
1993	7330	48187	0	55517	3,075	43
1994	6722	44350	0	51072	2,940	41
1995	6394	44370	0	50764	2,918	42
1996	6513	45154	0	51667	2,990	41
1997	7007	46611	0	53618	3,071	42
1998	7732	51773	0	59505	3,423	41
1999	7057	54487	0	61544	3,634	41
2000	8453	61974	0	70427	3,321	51
2001	9817	71986	0	81803	4,331	46
2002	10371	76055	0	86426	4,544	46
Annual Growth Rates from 1992 to 2002 for each of the categories above						
	2.77%	4.95%	0.00%	4.66%	4.63%	0.31%

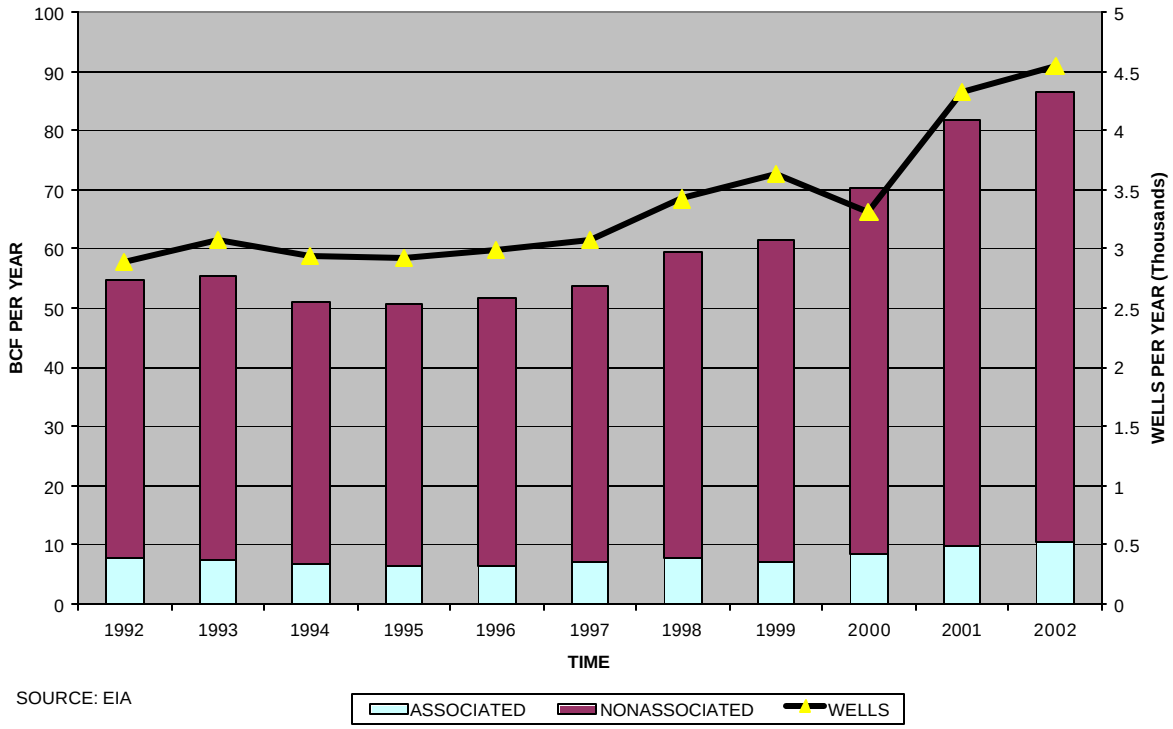
[5] Annual production is in million cubic feet (MMCF) and the production per well per day is in thousand cubic feet (MCF).

MONTANA NATURAL GAS PRODUCTION

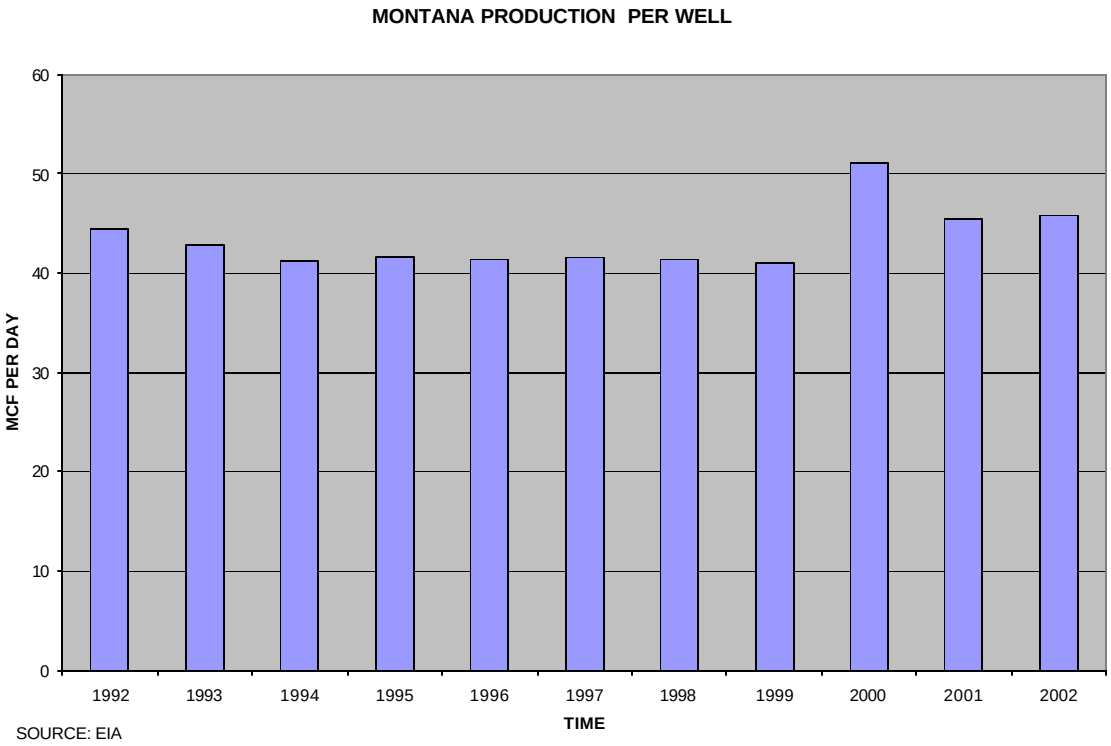


SOURCE: EIA

MONTANA PRODUCTION BY GAS TYPE / WELL COUNT



SOURCE: EIA


MONTANA PRODUCTION PER WELL
MCF PER DAY
60
50
40
30
20
10
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME

SOURCE: EIA

Nebraska – Natural Gas Production

In 2002, Nebraska produced approximately 1.2 billion cubic feet (bcf) of natural gas. This represented almost one percent of the WIEB region's production and only five thousandth of one percent of the United States' overall production. The main sources of natural gas for this production were associated and nonassociated. Coalbed methane production did not exist in Nebraska in 2002.

Between 1992 and 2002, Nebraska's natural gas production increased at the rate of 0.1 percent per year, experiencing peak production during 1994 when it produced 2.9 Tcf. Since then, its production has declined steadily from 1994 to 2002.

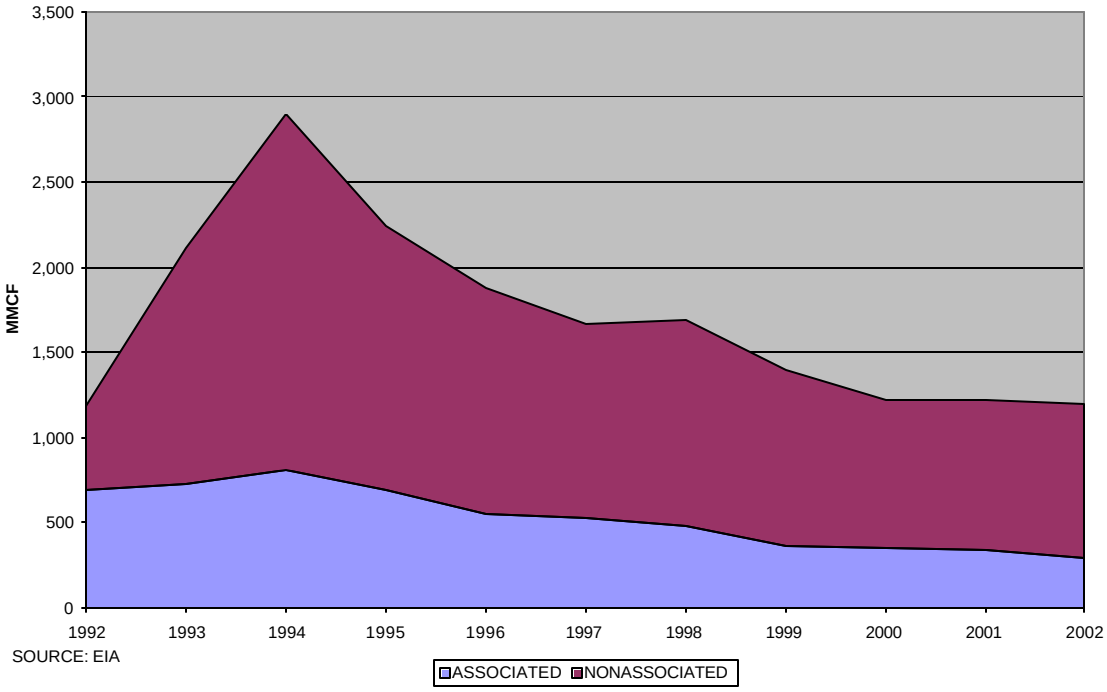
From 1992 to 1994 the number of gas producing wells increased at the fastest rate and since then the rate of increase has slowed. Overall, the number of gas producing wells in Nebraska increased at the rate of 17.0 percent per year from 1992 to 2002.

Nebraska's production per well per day is following the trend seen in most other states and is declining at a much faster rate than observed in the other states. The production per well has decreased at an annual rate of approximately 14.4 percent per year. In 1992 production per well was 147 thousand cubic feet (Mcf) per day and this had declined to 31 Mcf per day in 2002.

Years	Associated[6] (MMCF)	Nonassociated (MMCF)	CBM (MMCF)	Totals (MMCF)	Nonassociated and CBM Wells	Production Per Well Per Day (MCF)
1992	691	486	0	1177	22	147
1993	723	1391	0	2114	59	98
1994	805	2093	0	2898	87	91
1995	683	1557	0	2240	87	71
1996	548	1328	0	1876	88	58
1997	526	1144	0	1670	91	50
1998	480	1214	0	1694	95	49
1999	356	1040	0	1396	96	40
2000	349	869	0	1218	98	34
2001	332	886	0	1218	96	35
2002	288	904	0	1192	106	31
Annual Growth Rates from 1992 to 2002 for each of the categories above						
	-8.38%	6.40%	0.00%	0.13%	17.03%	-14.44%

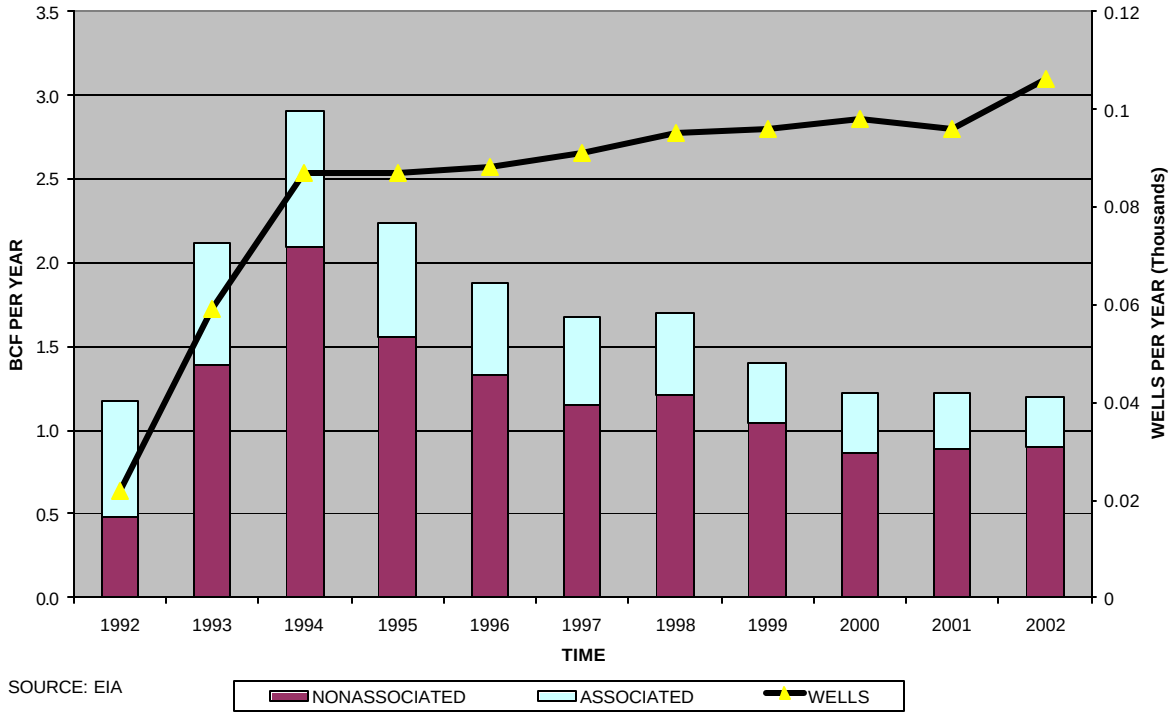
[6] Annual production is in million cubic feet (MMCF) and the production per well per day is in thousand cubic feet (MCF).

NEBRASKA NATURAL GAS PRODUCTION

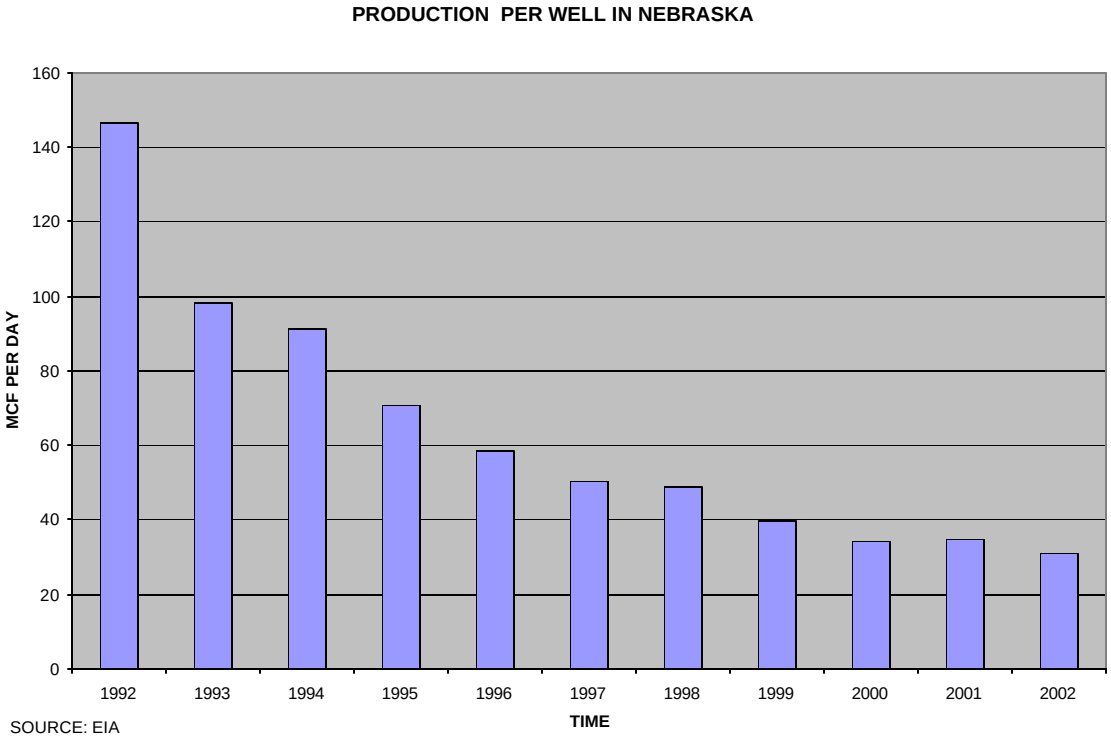


SOURCE: EIA

NEBRASKA NONASSOCIATE & CBM / WELL COUNT



SOURCE: EIA


PRODUCTION PER WELL IN NEBRASKA
MCF PER DAY
160
140
120
100
80
60
40
20
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME

SOURCE: EIA

Nevada – Natural Gas Production

There was no reported production of natural gas in this state during the period from 1992 to 2002. The Energy Information Administration reported no production based on the indicated four to five wells that existed from 1996 to 2002. Due to lack of data, no charts are available for this State.

Years	Associated[7] (MMCF)	Nonassociated (MMCF)	CBM (MMCF)	Totals (MMCF)	Nonassociated and CBM Wells	Production Per Well Per Day (MCF)
1992	0	0	0	0		
1993	0	0	0	0		
1994	0	0	0	0		
1995	0	0	0	0		
1996	0	0	0	0	5	0
1997	0	0	0	0	5	0
1998	0	0	0	0	4	0
1999	0	0	0	0	4	0
2000	0	0	0	0	4	0
2001	0	0	0	0	4	0
2002	0	0	0	0	4	0
Annual Growth Rates from 1992 to 2002 for each of the categories above						
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

[7] Annual production is in million cubic feet (MMCF) and the production per well per day is in thousand cubic feet (MCF).

New Mexico – Natural Gas Production

In 2002, New Mexico's natural gas production was 1,656 billion cubic feet (Bcf). This production was divided between associated gas 23 Bcf, non-associated gas 962 Bcf and coalbed methane 471 Bcf. This represents approximately 14.4 percent of the natural gas production in the WIEB region, and 6.9 percent of the United States natural gas production.

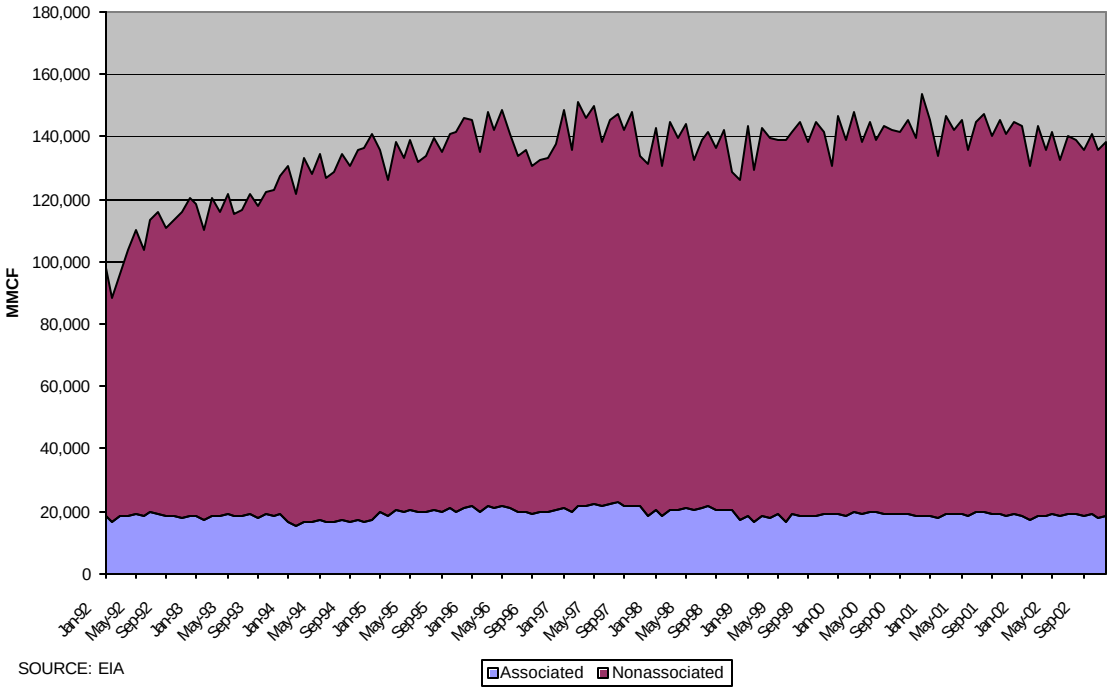
New Mexico production increased significantly between 1992 and 1995 going from 1,290 Bcf to 1,641 Bcf. Since 1995, their production has been relatively flat. The ability of the state to maintain its current level of natural gas production has come from the development of its coalbed methane (CBM) resources. The state has approximately 4.4 trillion cubic feet (Tcf) of CBM proven natural gas reserves. Natural gas production associated with coalbed methane has increased at an annual rate of 2.8 percent since 1992 and the non-associated natural gas production has increased at about 3.1 percent annually. Associated natural gas production from oil wells has been flat over this time. Over all New Mexico's natural gas production has increased at an annual rate of 2.5 percent.

The number of natural gas producing wells (non-associated and CBM) has increased at an annual rate of 7.1 percent. The major reason for this increase is the development of CBM. Field development for CBM requires closer well spacing and the producing wells are normally less productive. This has resulted in a decline in the production per well decreasing at an annual rate of 3.8 percent.

Years	Associated[8] (MMCF)	Nonassociated (MMCF)	CBM (MMCF)	Totals (MMCF)	Nonassociated and CBM Wells	Production Per Well Per Day (MCF)
1992	222304	709,476	358,000	1,289,780	18,040	162
1993	221558	722,773	486,000	1,430,331	20,846	159
1994	200041	851,757	530,000	1,581,798	23,292	163
1995	242248	824,632	574,000	1,640,880	23,510	163
1996	246560	843,116	575,000	1,664,676	24,134	161
1997	257365	863,104	597,000	1,717,469	27,421	146
1998	243460	833,465	571,000	1,647,925	28,200	136
1999	219900	871,917	582,000	1,673,817	26,007	153
2000	229436	942,612	550,000	1,722,048	33,948	120
2001	227535	967,855	517,000	1,712,390	35,217	116
2002	222942	961,967	471,000	1,655,909	35,873	109
Annual Growth Rates from 1992 to 2002 for each of the categories above						
	0.03%	3.09%	2.78%	2.53%	7.12%	-3.85%

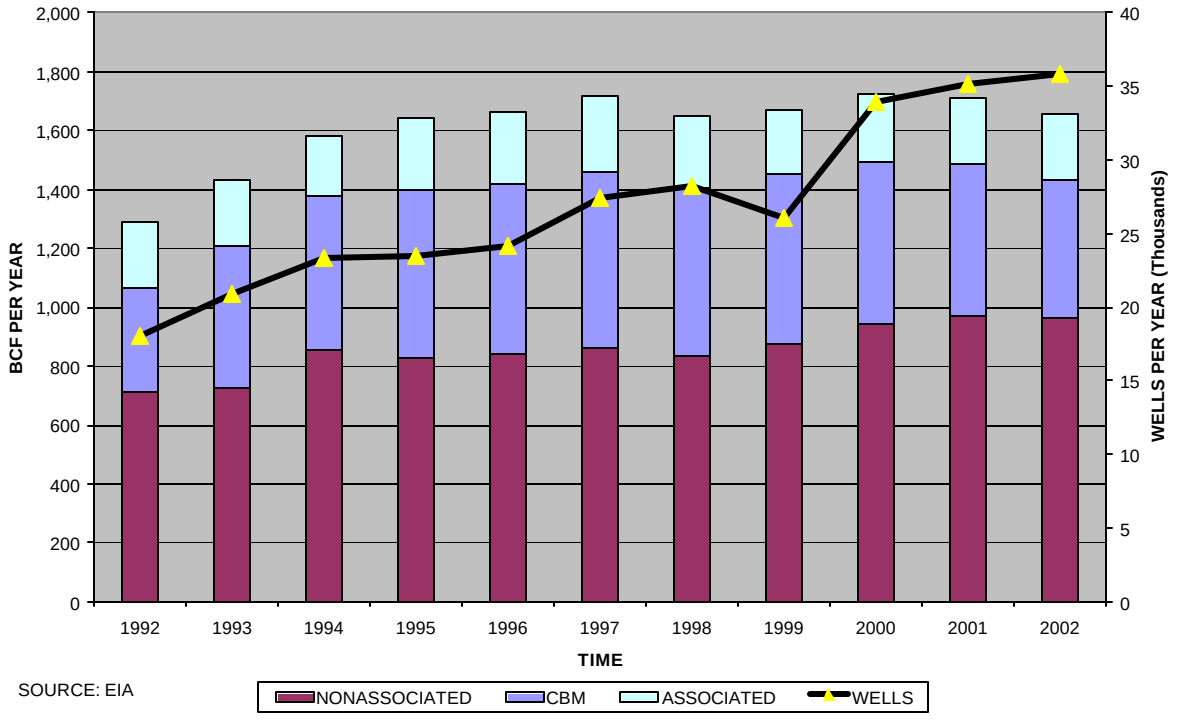
[8] Annual production is in million cubic feet (MMCF) and the production per well per day is in thousand cubic feet (MCF).

NEW MEXICO NATURAL GAS PRODUCTION

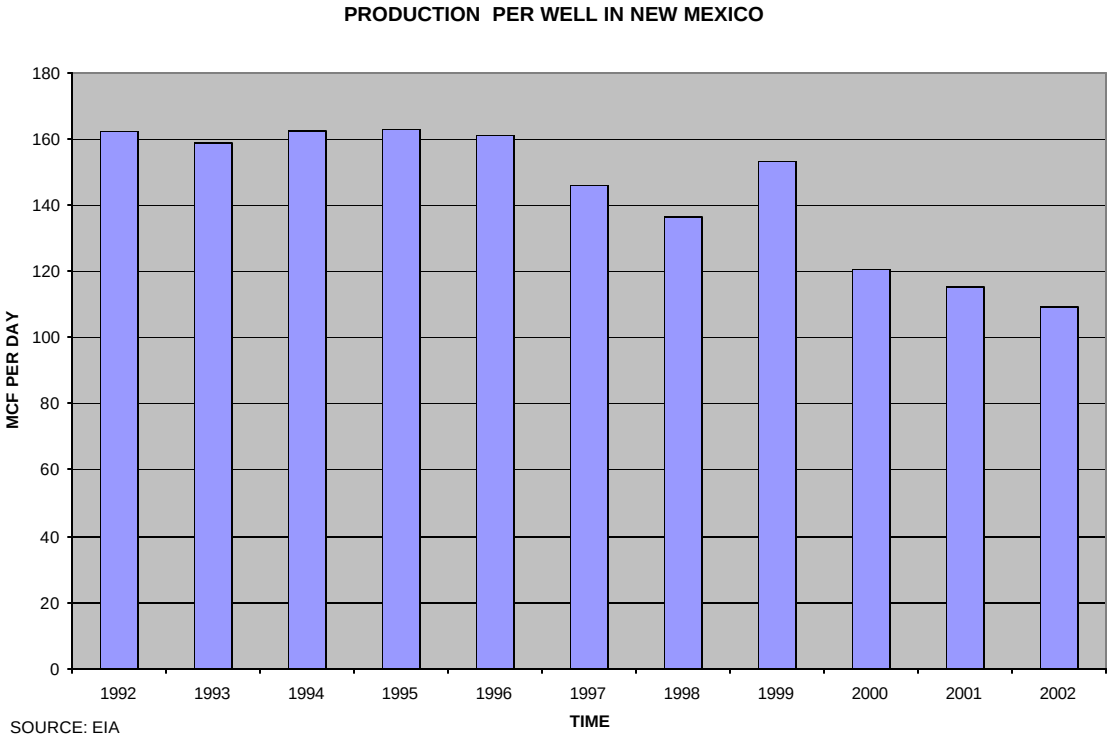


SOURCE: EIA

NEW MEXICO NONASSOCIATE & CBM / WELL COUNT



SOURCE: EIA


PRODUCTION PER WELL IN NEW MEXICO
MCF PER DAY
180
160
140
120
100
80
60
40
20
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME

SOURCE: EIA

Oregon – Natural Gas Production

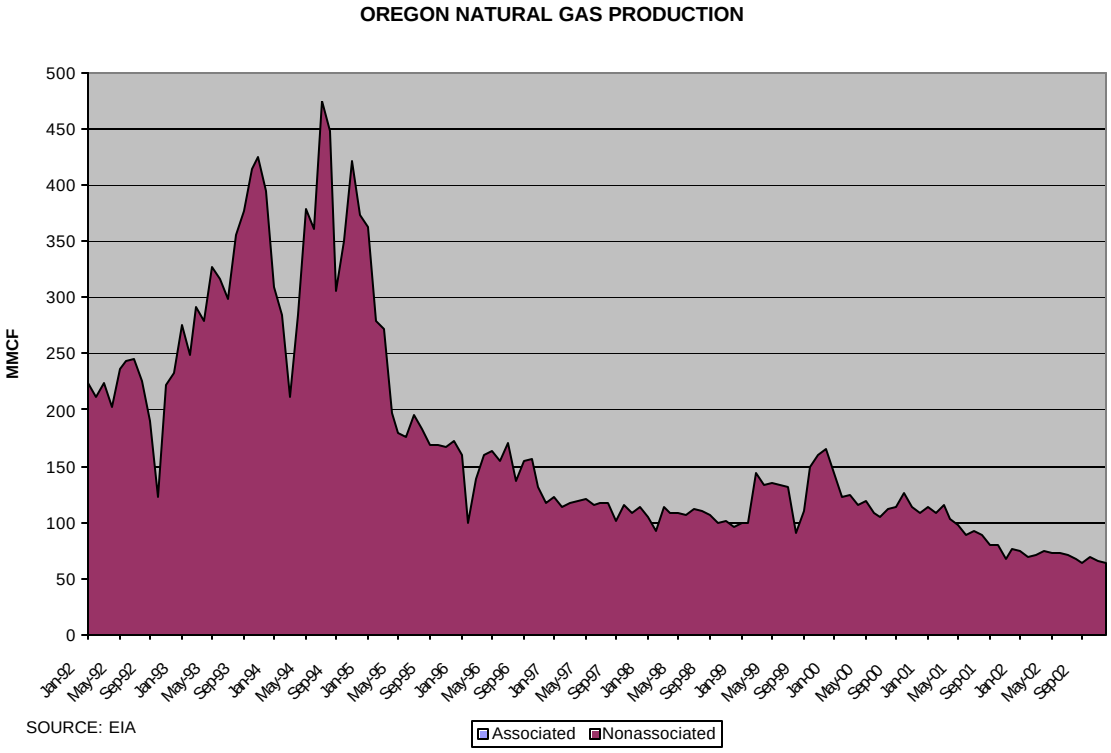
In 2002, Oregon had produced 836 million cubic feet (MMcf) of natural gas. This amount represented less than 1% of the WIEB regions as well as the United States production. All of this production came from nonassociated sources.

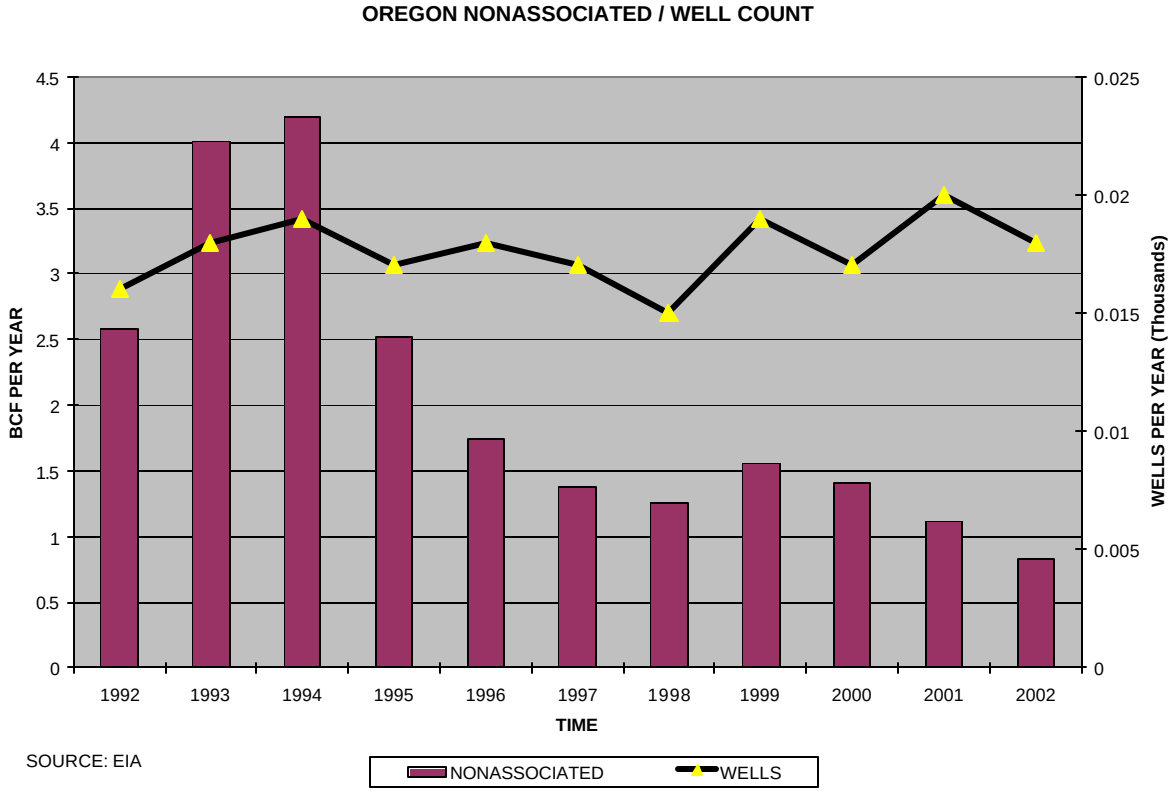
From 1992 to 2002, Oregon's natural gas production has decreased at a rate of 11.7% per year. Oregon experienced the highest production of natural gas in the years 1993 and 1994 and this was mainly due to the increase in the number of operating wells. Since that time, its production has gradually declined.

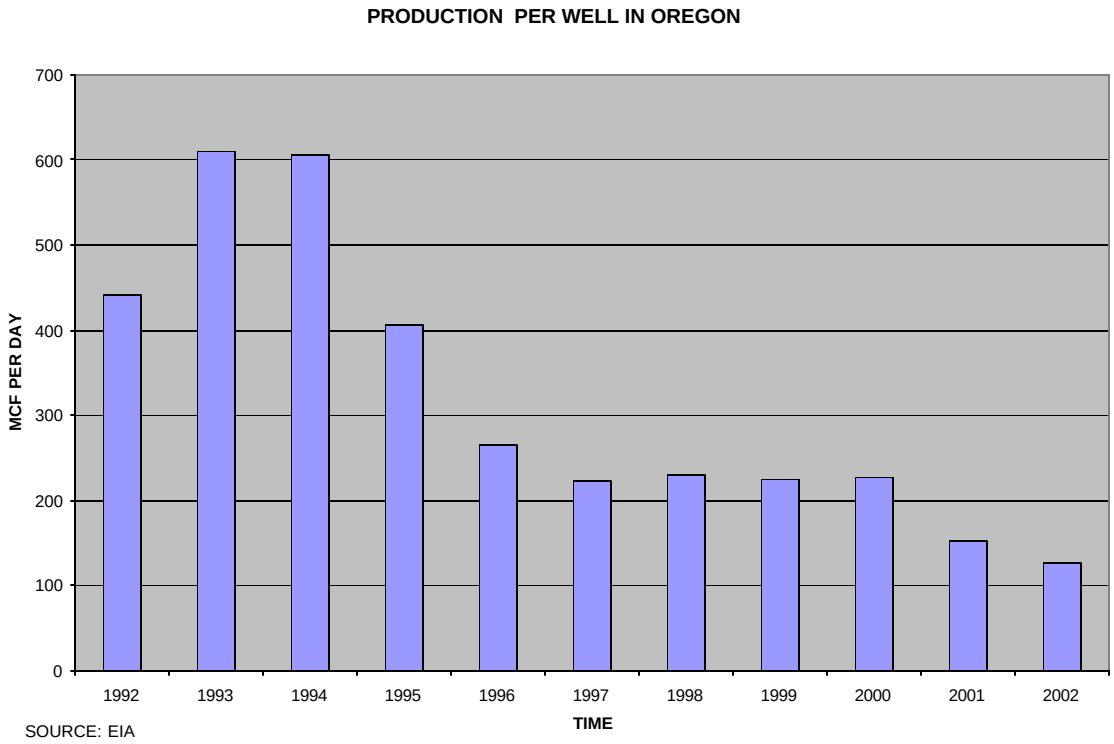
The production well count from 1992 to 2002 has increased at the rate of 1.2% per year. Peaking in 1994, 1999, and again in 2001 at 19, 19, and 20 wells. Production per well per day has declined 11.7% annually. Production peaked in the years 1993 and 1994 at 609 thousand cubic feet (Mcf) and 606 Mcf, and thereafter has steadily declined.

Years	Associated[9] (MMcf)	Nonassociated (MMcf)	CBM (MMcf)	Totals (MMcf)	Nonassociated and CBM Wells	Production Per Well Per Day (Mcf)
1992	0	2,581	0	2,581	16	442
1993	0	4,004	0	4,004	18	609
1994	0	4,202	0	4,202	19	606
1995	0	2,520	0	2,520	17	406
1996	0	1,744	0	1,744	18	265
1997	0	1,383	0	1,383	17	223
1998	0	1,262	0	1,262	15	231
1999	0	1,556	0	1,556	19	224
2000	0	1,410	0	1,410	17	227
2001	0	1,112	0	1,112	20	152
2002	0	836	0	836	18	127
Annual Growth Rates from 1992 to 2002 for each of the categories above						
	0.00%	-10.66%	0.00%	-10.66%	1.18%	-11.71%

[9] Annual production is in million cubic feet (MMCF) and the production per well per day is in thousand cubic feet (MCF).


OREGON NATURAL GAS PRODUCTION
MMCF
500
450
400
350
300
250
200
150
100
50
0
Jan-92
May-92
Sep-92
Jan-93
May-93
Sep-93
Jan-94
May-94
Sep-94
Jan-95
May-95
Sep-95
Jan-96
May-96
Sep-96
Jan-97
May-97
Sep-97
Jan-98
May-98
Sep-98
Jan-99
May-99
Sep-99
Jan-00
May-00
Sep-00
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
SOURCE: EIA
Associated
Nonassociated


OREGON NONASSOCIATED / WELL COUNT
BCF PER YEAR
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
WELLS PER YEAR (Thousands)
0.025
0.02
0.015
0.01
0.005
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME
SOURCE: EIA
NONASSOCIATED
WELLS


PRODUCTION PER WELL IN OREGON
MCF PER DAY
700
600
500
400
300
200
100
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME

SOURCE: EIA

Utah – Natural Gas Production

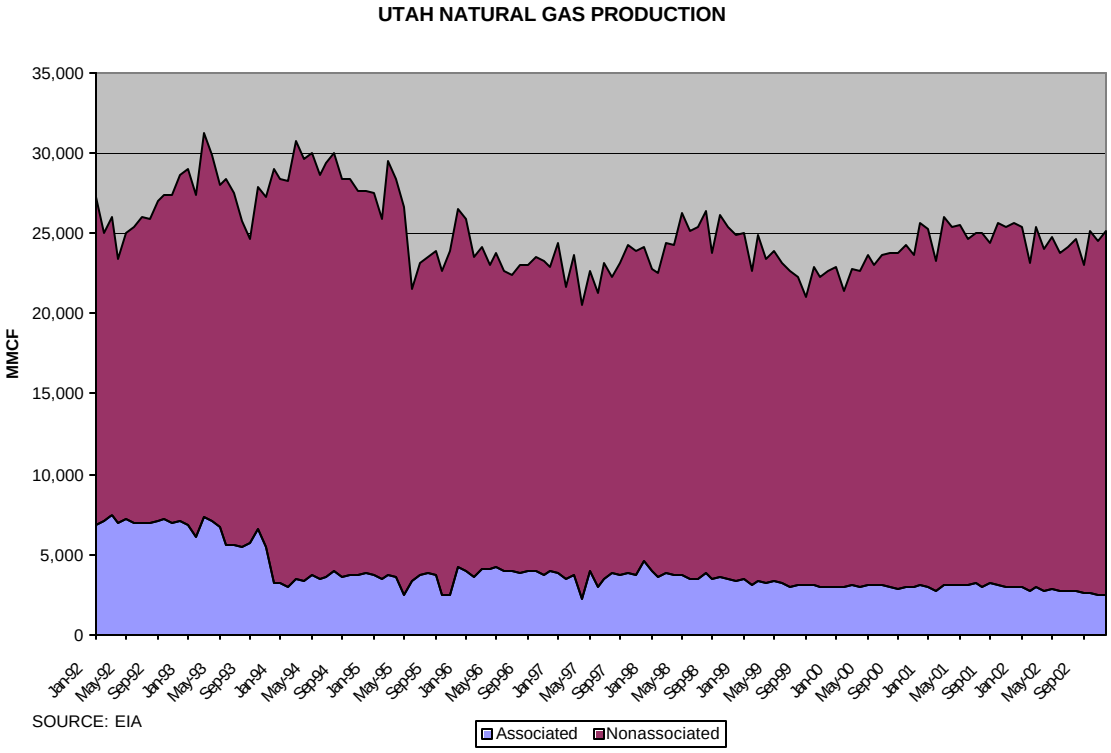
In 2002, Utah produced 293 billion cubic feet (Bcf) of natural gas from associated, nonassociated and coalbed methane resources. This represented 2.6% of the WIEB regions production and only 1.2% of the United States overall production.

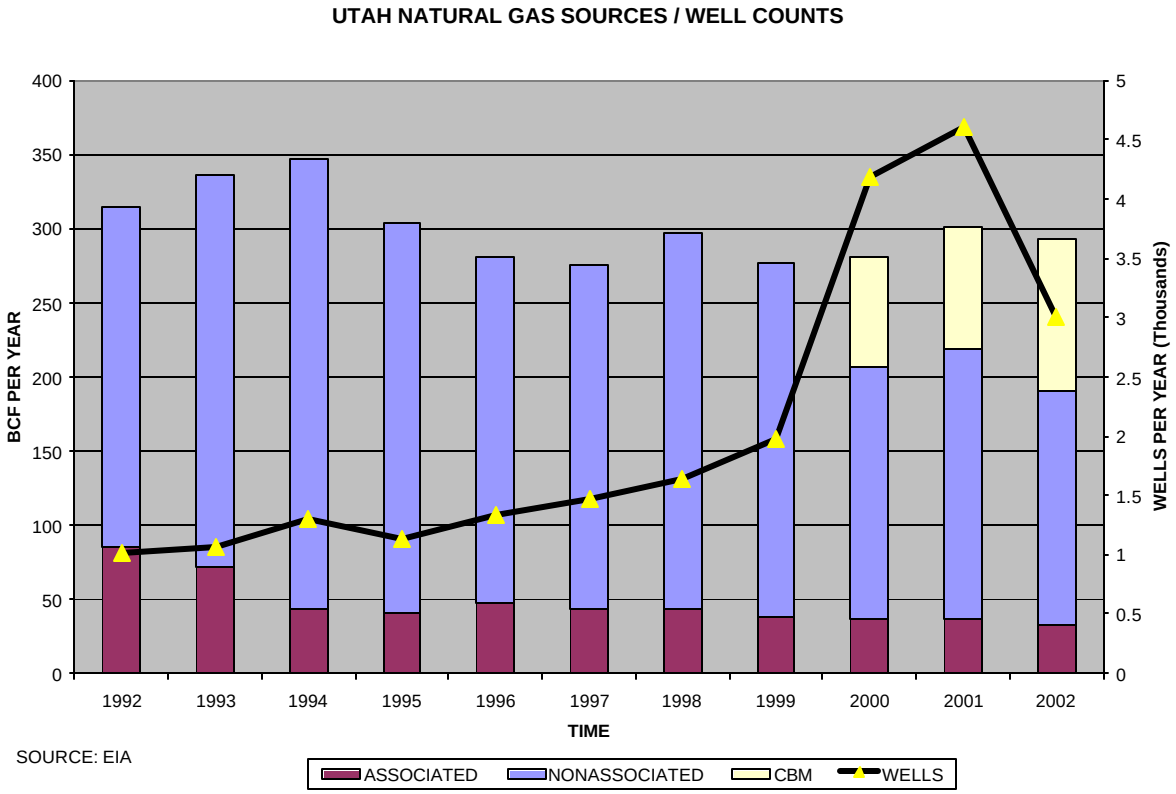
From 1992 to 2002, the state's natural gas production declined at the rate of 0.7% annually. This entire decline came from the associated and the nonassociated production. This production decreased at 9.1% per year and 3.7%, per year respectively. The development of coalbed methane resources has allowed the state to reverse its decline in production. Coalbed methane accounted for 35 percent of the 2002 natural gas production. Coalbed methane data is only available from the year 2000. Over the last three years natural gas production from this source grew at an annual rate of 17.9%. The production well counts from1992 to 2002, grew at the rate of 11.6% per year and production per well per day has declined at the rate of 9.2% per year.

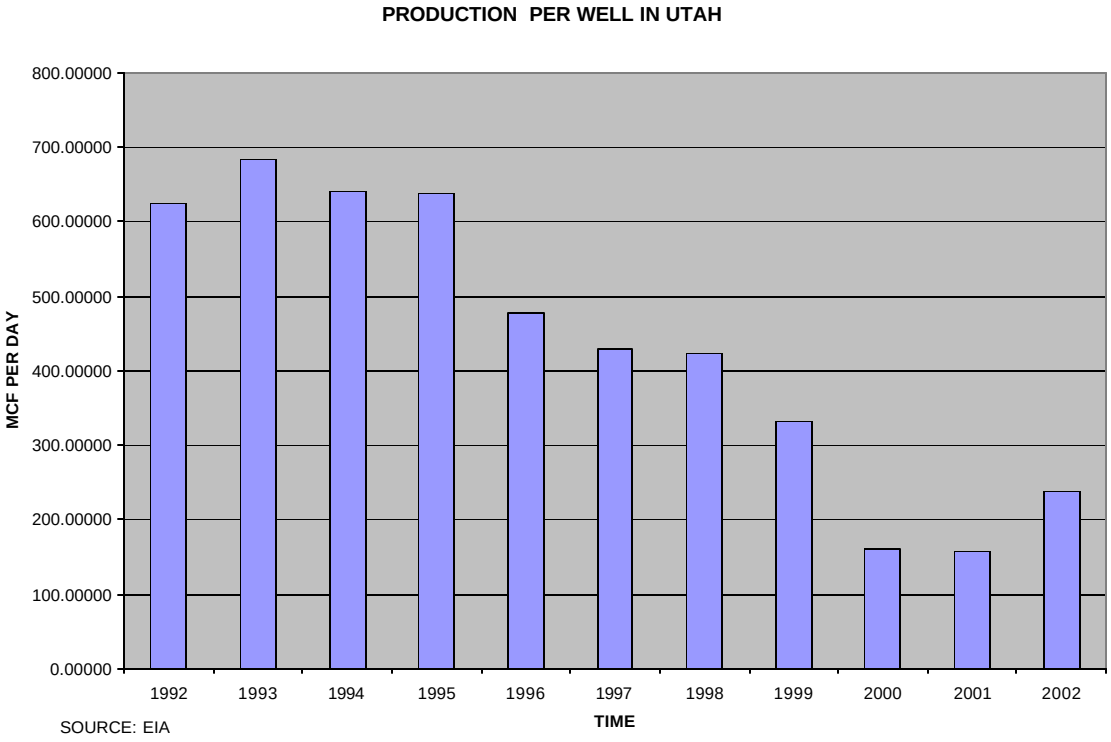
The number of wells producing natural gas increased from 1992 to 2001 from 1,006 to 4,601. In 2002, it declined to 3,005 producing wells. During the same period, production per well per day in thousand cubic feet had also declined up until 2001. In 2002, this number increased, mainly the result of a faster decline in the number of producing wells rather than an overall production decrease.

YEARS	ASSOCIATED[10] (MMCF)	NONASSOCIATED (MMCF)	CBM (MMCF)	TOTALS (MMCF)	NONASSOCIATED AND CBM WELLS	PRODUCTION PER WELL PER DAY (MCF)
1992	84781	229,494	0	314,275	1,006	625
1993	71701	264,480	0	336,181	1,061	683
1994	42670	304,346	0	347,016	1,303	640
1995	40834	262,399	0	303,233	1,127	638
1996	47615	233,593	0	281,208	1,339	478
1997	43552	231,368	0	274,920	1,475	430
1998	43503	253,760	0	297,263	1,643	423
1999	38020	238,947	0	276,967	1,978	331
2000	36290	170,827	74000	281,117	4,178	161
2001	36612	181,809	83000	301,421	4,601	158
2002	32509	157,554	103000	293,063	3,005	238
Annual Growth Rates from 1992 to 2002 for each of the categories above						
	-9.14%	-3.69%	NA	-0.70%	11.56%	-9.22%

[10] Annual production is in million cubic feet (MMCF) and the production per well per day is in thousand cubic feet (MCF).


UTAH NATURAL GAS PRODUCTION
MMCF
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Jan-92
May-92
Sep-92
Jan-93
May-93
Sep-93
Jan-94
May-94
Sep-94
Jan-95
May-95
Sep-95
Jan-96
May-96
Sep-96
Jan-97
May-97
Sep-97
Jan-98
May-98
Sep-98
Jan-99
May-99
Sep-99
Jan-00
May-00
Sep-00
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
SOURCE: EIA
Associated
Nonassociated


UTAH NATURAL GAS SOURCES / WELL COUNTS
BCF PER YEAR
WELLS PER YEAR (Thousands)
400
350
300
250
200
150
100
50
0
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME
SOURCE: EIA
ASSOCIATED
NONASSOCIATED
CBM
WELLS


PRODUCTION PER WELL IN UTAH
800.00000
700.00000
600.00000
500.00000
400.00000
300.00000
200.00000
100.00000
0.00000
MCF PER DAY
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME

SOURCE: EIA

Wyoming – Natural Gas Production

In 2002, Wyoming's natural gas production was 1,747 Billion cubic feet (Bcf). This production was divided between associated gas of 174 BCF, non-associated gas of 1,270 Bcf and coalbed methane (CBM) of 302 Bcf. This represents approximately 15.2 percent of the natural gas production in the WIEB region, and 7.3 percent of the United States natural gas production.

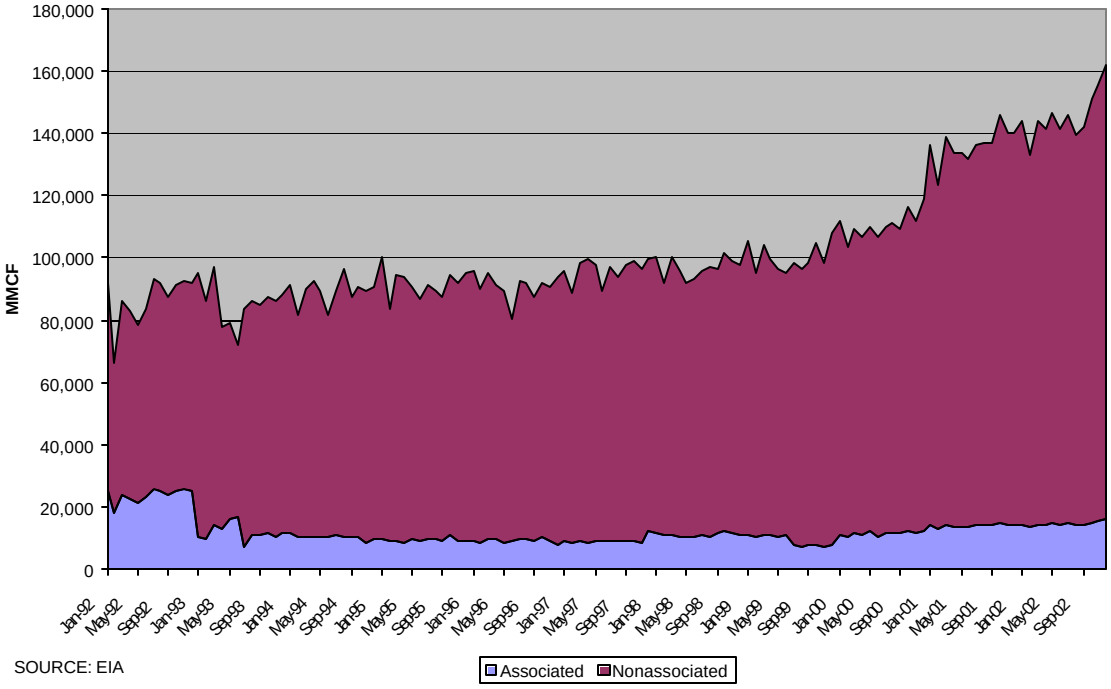
Between 1992 and 2002, Wyoming's natural gas production increased at a rate of 5.4 percent annually. The State's associated natural gas production declined at an annual rate of 4.8 percent over this time. The state has been able to cover the decline in associated natural gas production from increased non-associated natural gas and coalbed methane (CBM) production. In 1992, associated natural gas production accounted for 27.5 percent of the natural gas produced. By 2002, this volume declined by some 110 Bcf and now accounts for only 10 percent of the states natural gas production.

During this same period (1992 – 2002), the non-associated natural gas production increased at an annual rate of 5.4 percent to allow for an overall annual growth rate of 5.4 percent. This represents an increase of 821 Bcf in non-associated natural gas production since 1992. This increase is composed of 302 Bcf from CBM and 519 Bcf from natural gas wells. In 2002, CBM accounted for 17 percent of their natural gas production.

Years	Associated[11] (MMcf)	Nonassociated (MMcf)	CBM (MMcf)	Totals (MMcf)	Nonassociated and CBM Wells	Production Per Well Per Day (Mcf)
1992	285,123	751,693	0	1,036,816	3,111	662
1993	142,005	880,598	0	1,022,603	3,615	667
1994	121,520	949,342	0	1,070,862	3,942	660
1995	111,441	988,670	0	1,100,111	4,196	646
1996	109,434	981,115	0	1,090,549	4,510	596
1997	109,317	1,043,796	0	1,153,113	5,160	554
1998	132,043	1,029,401	0	1,161,444	5,166	546
1999	108,919	1,091,320	0	1,200,239	4,950	604
2000	137,384	1,055,657	133,000	1,326,041	9,907	329
2001	167,656	1,189,332	278,000	1,634,988	13,978	288
2002	174,749	1,270,727	302,000	1,747,476	15,608	276
Annual Growth Rates from 1992 to 2002 for each of the categories above						
	-4.78%	5.39%	NA	5.36%	17.50%	-8.37%

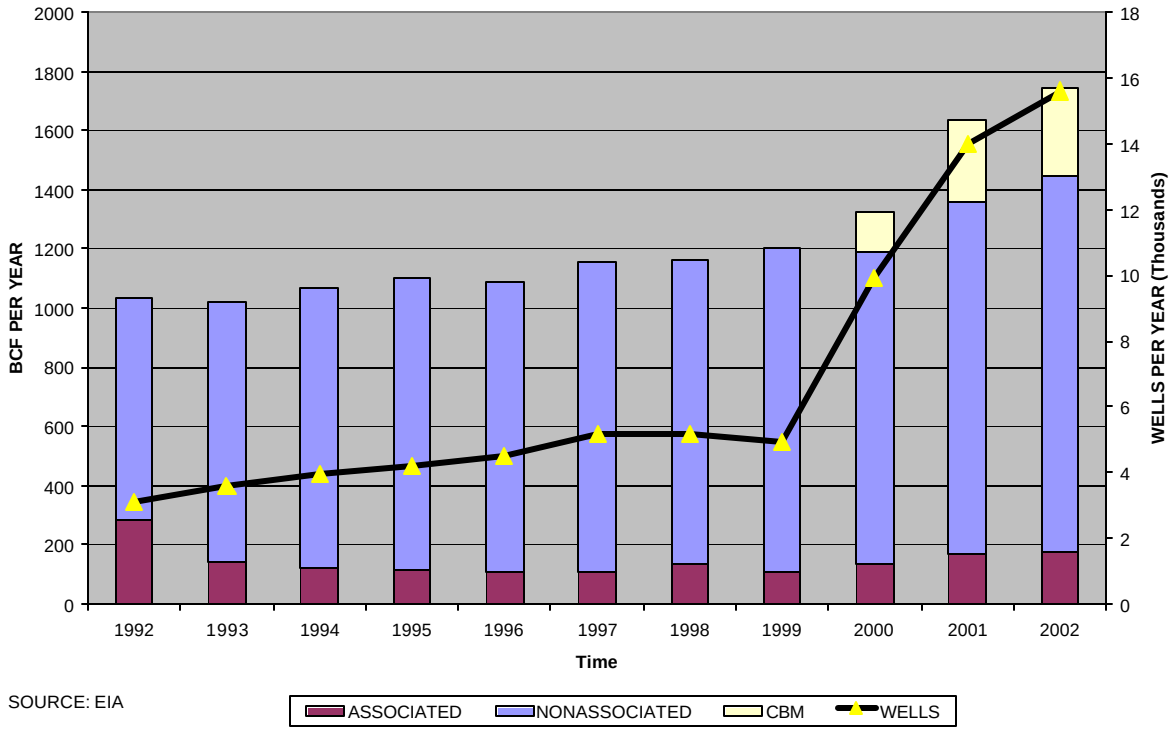
[11] Annual production is in million cubic feet (MMCF) and the production per well per day is in thousand cubic feet (MCF).

WYOMING NATURAL GAS PRODUCTION

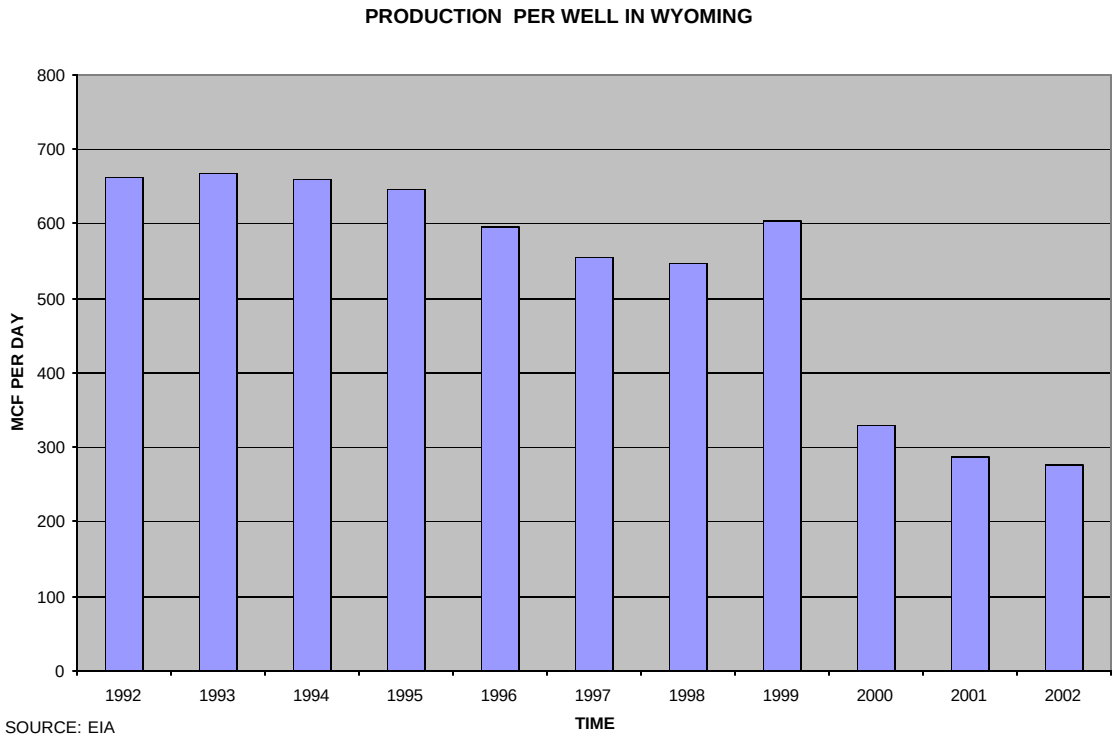


SOURCE: EIA

WYOMING NATURAL GAS SOURCES / WELL COUNTS



SOURCE: EIA


PRODUCTION PER WELL IN WYOMING
800
700
600
500
400
300
200
100
0
MCF PER DAY
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
TIME

SOURCE: EIA

Alberta, Canada – Natural Gas Production

In 2002, Alberta's natural gas production totaled approximately 5 trillion cubic feet (Tcf). This represented 43.2 percent of the WIEB regions production and approximately 74.9 percent of Canada's overall production. According to the data below, Alberta's natural gas production reached its peak in 1999[12].

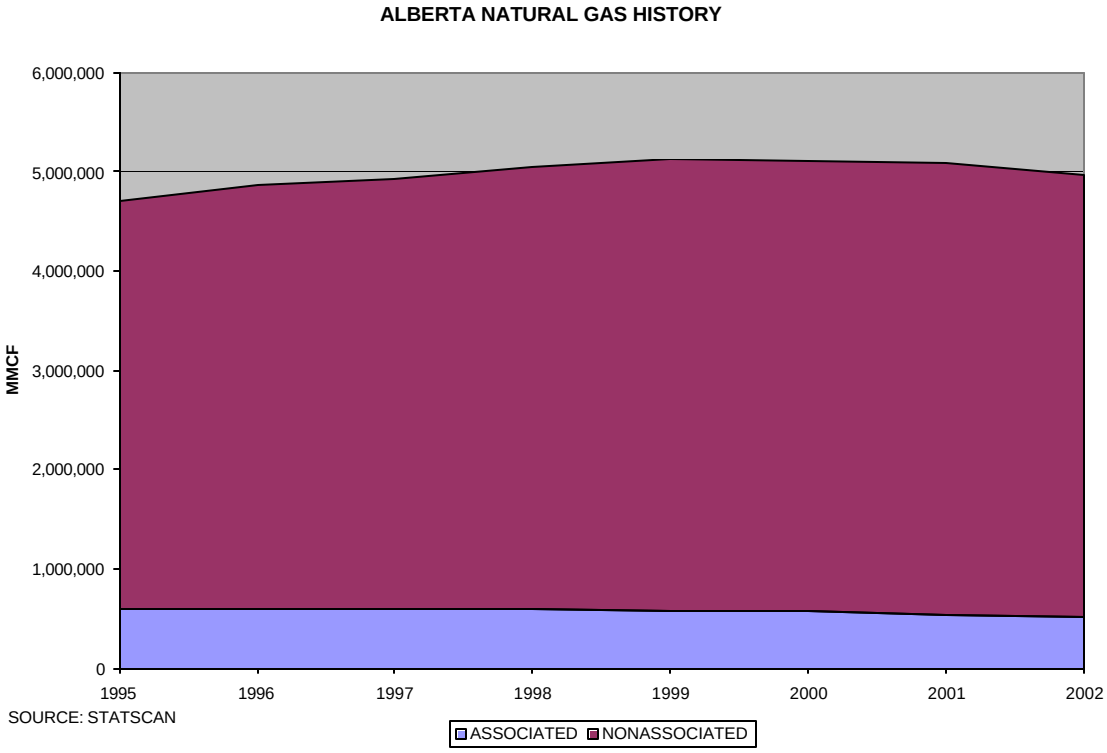
Alberta's associated production declined from 1995 to 2002 at the rate of 1.9 percent, while the nonassociated production increased during the same period at the rate of 1.1 percent. Overall, Alberta's production has increased approximately 0.8 percent per year from 1995 to 2002. Western Canada, unlike the states in the Western United States, is a major exporter of its natural gas production. These exports from western Canada supply the majority of Canada's natural gas requirements and some 15 percent of the United States natural gas consumption. During this time, Alberta increased its exports at an annual rate of 0.5.

Total well count data was not available.

Years	Associated[13] (MMcf)	Nonassociated (MMcf)	Total (MMcf)	Exports (Imports)
1995	589,819	4,110,954	4,700,773	4,182,364
1996	599,447	4,264,675	4,864,121	4,288,003
1997	595,791	4,332,617	4,928,408	4,366,884
1998	588,147	4,463,521	5,051,668	4,499,044
1999	578,789	4,543,764	5,122,552	4,571,739
2000	571,246	4,535,408	5,106,654	4,454,572
2001	545,803	4,552,937	5,098,740	4,514,469
2002	516,989	4,448,696	4,965,685	4,335,696
Annual Growth Rates from 1995 to 2002 for each of the categories above				
	-1.87%	1.13%	0.79%	0.52%

Source: Statscan

[12] However, more production history will be needed before any firm conclusions can be reached regarding the potential decline in Alberta's production.
[13] Annual production is in million cubic feet (MMCF)


ALBERTA NATURAL GAS HISTORY
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
MMCF
1995
1996
1997
1998
1999
2000
2001
2002
SOURCE: STATSCAN
ASSOCIATED
NONASSOCIATED

British Columbia, Canada – Natural Gas Production

In 2002, British Columbia produced a total of 1.2 trillion cubic feet of natural gas. This represented approximately 10 percent of the WIEB region's production and only 17.3 percent of Canada's overall production. According to the data below, British Columbia is still increasing its natural gas production.

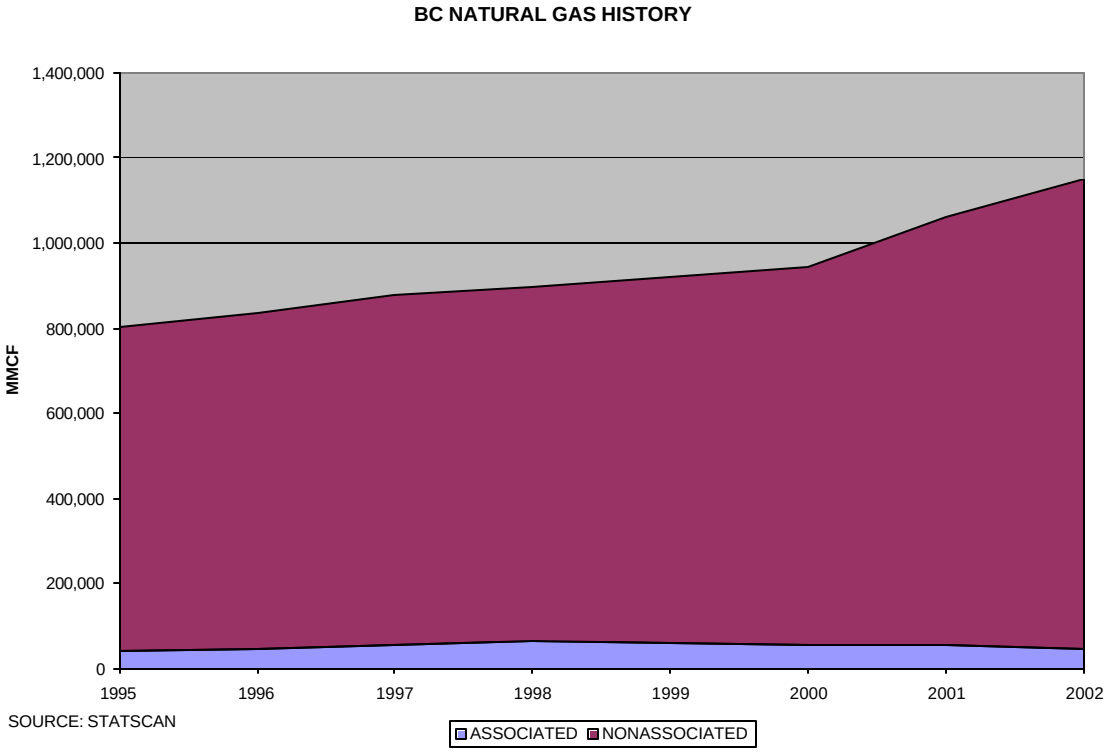
Associated production in this province increased from 1995 to 2002 at the rate of 2.4 percent per year, while the nonassociated production increased at 5.4 percent per year during the same period. Overall production accelerated at approximately 5.3 percent per year. Western Canada, unlike the states in the Western United States, is a major exporter of its natural gas production. These exports from western Canada supply the majority of Canada's natural gas requirements and some 15 percent of the United States natural gas consumption. British Columbia also experienced an increase in exports of this commodity at an annual rate of 7.2 percent.

Total well count data was not available.

Years	Associated[14] (MMcf)	Nonassociated (MMcf)	Total (MMcf)	Exports (Imports)
1995	39,043	763,115	802,158	521,165
1996	46,142	787,961	834,103	562,807
1997	56,790	819,905	876,695	612,543
1998	63,889	834,103	897,991	634,187
1999	60,339	858,948	919,288	653,345
2000	56,790	887,343	944,133	645,430
2001	56,790	1,004,473	1,061,263	755,784
2002	46,000	1,104,000	1,150,000	849,681
Annual Growth Rates from 1995 to 2002 for each of the categories above				
	2.37%	5.42%	5.28%	7.23%

Source: Statscan

[14] Annual production is in million cubic feet (MMCF)


BC NATURAL GAS HISTORY
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
MMCF
1995
1996
1997
1998
1999
2000
2001
2002
SOURCE: STATSCAN
ASSOCIATED
NONASSOCIATED

Saskatchewan, Canada – Natural Gas Production

In 2002, Saskatchewan's natural gas production was approximately 0.3 trillion cubic feet.
This represented a total of 2.6 percent of the WIEB region's production and 4.4 percent of Canada's total production[15].

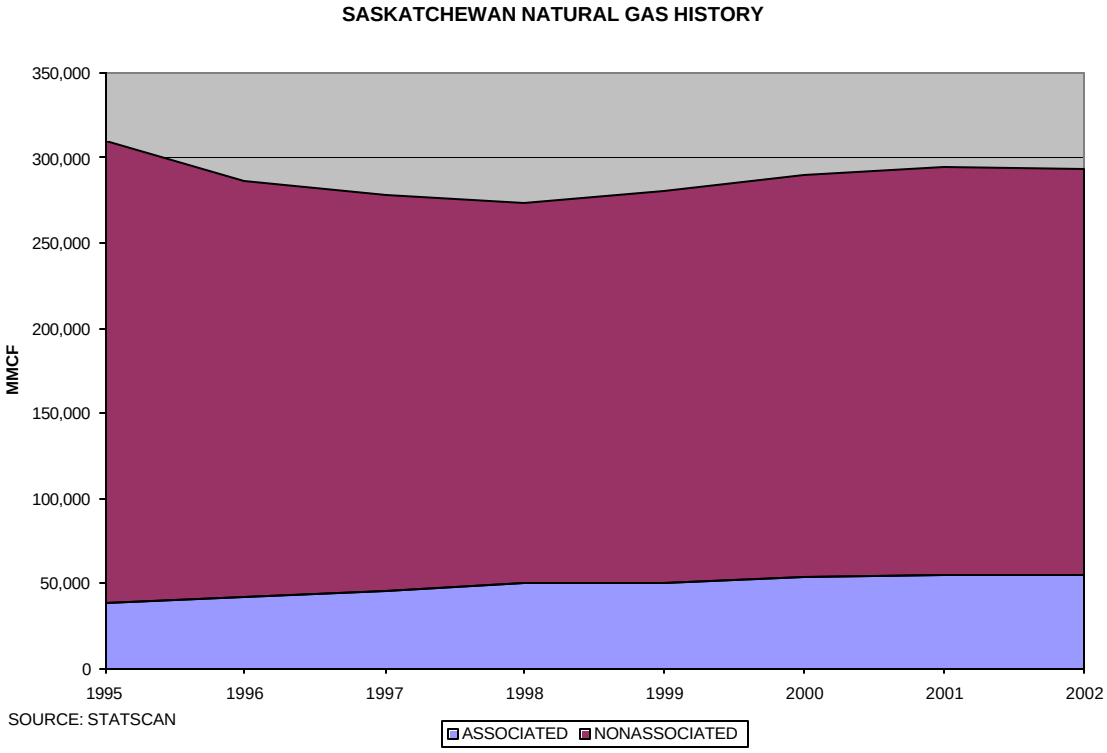
The associated production of natural gas increased at approximately 5.2 percent per year from 1995 to 2002. Over this period, nonassociated production declined at about 1.8 percent per year. Overall, natural gas production in Saskatchewan has declined at an annual rate of approximately 0.7 percent. This has led to decreases in natural gas being exported to other Canadian providences and the United States. Exports on average have declined at approximately 2.8 percent per year, decreasing from 180 billion cubic feet in 1995 to 148 billion cubic feet in 2002 (total decrease of almost 18 percent).

Total well count data was not available

Years	Associated[16] (MMCF)	Nonassociated (MMCF)	Total (MMCF)	Exports (Imports)
1,995	38,125	271,326	309,451	179,566
1,996	42,046	244,432	286,479	147,471
1,997	45,733	231,819	277,552	144,270
1,998	49,675	223,480	273,155	141,481
1,999	50,595	230,204	280,799	149,999
2,000	54,068	235,269	289,336	140,928
2,001	55,325	238,912	294,237	151,858
2,002	54,465	239,357	293,822	147,593
Annual Growth Rates from 1995 to 2002 for each of the categories above				
	5.23%	-1.77%	-0.74%	-2.76%

Source: Statscan

[15] However, more production history will be needed before any firm conclusions can be reached regarding Saskatchewan's production decline
[16] Annual production is in million cubic feet (MMCF)


SASKATCHEWAN NATURAL GAS HISTORY
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
MMCF
1995
1996
1997
1998
1999
2000
2001
2002
SOURCE: STATSCAN
ASSOCIATED
NONASSOCIATED

Natural Gas Infrastructure: Interstate Pipelines and Market Centers/Hubs

Pipelines

United States

The pipeline infrastructure (grid) is an important and vital part of the natural gas market. Mainline transmission lines (interstate pipeline) are the primary link between producing areas and the major load centers or end users. The United States natural gas transportation infrastructure has some 226 natural gas pipeline systems and approximately 306,000 miles of interstate and intrastate pipelines, made up of 97 interstate pipelines, 89 intrastate pipelines and 40 gathering systems. Not accounted in this total are the local distribution systems. In 2003, the system had 178 billion cubic feet per day of natural gas transportation capacity.

Table PL – 1: Pipelines Serving the WIEB Region indicates the interstate pipelines in the WIEB Region. This table gives the interstate pipelines in each state along with the upstream state (what state the line is coming from) and the downstream state (what state the line is going to).

Table PL – 1: Pipelines Serving the WIEB Region

Receiving State / Via Pipeline Company	Upstream State	Entering Capacity, MMcfpd	Down Stream States	Exiting Capacity, MMcfpd
Arizona				
El Paso Natural Gas Co	New Mexico	4,261	California, Nevada, Mexico	3,679
Transwestern Pipeline Co	New Mexico	1,090	California	1,225
California				
El Paso Natural Gas Co	Arizona	3,443	None	
Mojave Pipeline Co	Arizona	450	None	
Transwestern Pipeline Co	Arizona	1,225	None	
Pacific Interstate Offshore Co	Offshore California	60	None	
Kern River Gas Trans Co	Nevada	750	None	
Pacific Gas Transmission Co	Oregon	1,950	None	
Tuscarora Pipeline Co	Oregon	184	Nevada	184
Colorado				
Colorado Interstate Gas	Kansas	340	Kansas	244
Panhandle Eastern P L Co	Kansas	45	None	
KN Interstate Gas Co	Nebraska	97	Kansas, Nebraska	
Trailblazer Pipeline Co	Nebraska	500	Nebraska	500
Transwestern Pipeline Co	New Mexico	296	New Mexico	500
Colorado Interstate Gas	Oklahoma	200	Oklahoma	250
Colorado Interstate Gas	Utah	165	Wyoming	180
Northwest Pipeline Corp	Utah	337	Utah	587
Questar P L Co	Utah	23	None	
Colorado Interstate Gas	Wyoming	625	Oklahoma	250
Questar P L Co	Wyoming	313	None	

Williams Natural Gas Co	Wyoming	178	Kansas	186
Wyoming Interstate Co	Wyoming	499	None	
Idaho				
Pacific Gas Transmission Co	Canada	2,660	Washington	2,632
Northwest Pipeline Corp	Oregon	481	Nevada	158
Northwest Pipeline Corp	Utah	444	Utah	298
Northwest Pipeline Corp	Washington	122	None	
Montana				
Montana Power Co	Canada	64	Canada	6
Northern Border Pipeline Co	Canada	1,489	North Dakota	1,480
Northern Natural Gas Co	Canada	10	Canada	60
Williston Basin I P L Co	North Dakota	268	North Dakota	304
Colorado Interstate Gas	Wyoming	60	None	
Montana Power Co	Wyoming	2	None	
Williston Basin I P L Co	Wyoming	43	Wyoming	162
Nebraska				
KN Interstate Gas Co	Colorado	40	None	
Trailblazer Pipeline Co	Colorado	500	Colorado	500
ANR Pipeline Co	Kansas	693	Missouri	693
KN Interstate Gas Co	Kansas	81	Colorado	96
Nat Gas P L Co of America	Kansas	1,176	Iowa	1,330
Northern Natural Gas Co	Kansas	2,050	Iowa, South Dakota	1,365
Williams Natural Gas Co	Kansas	6	None	
KN Interstate Gas Co	Wyoming	120	None	
Trailblazer Pipeline Co	Wyoming	500	Colorado	500
Nevada				
El Paso Natural Gas Co	Arizona	191	None	
Tuscarora Pipeline Co	California	184	None	
Paiute Pipeline Co	Nevada	136	None	
Northwest Pipeline Corp	Idaho	158	None	
Kern River Gas Trans Co	Utah	750	California	750
New Mexico				
El Paso Natural Gas Co	Colorado	650	Arizona	650
Transcolorado Gas Trans Co	Colorado	120	None	
Transwestern Pipeline Co	Colorado	500	Arizona	500
El Paso Natural Gas Co	Texas	2,750	Arizona	4,261
Natural Gas P L Co of America	Texas	550	Texas	720
Transwestern Pipeline Co	Texas	950	Arizona	1,090
Oregon				
Northwest Pipeline Corp	Idaho	254	Washington	941
Northwest Pipeline Corp	Washington	739	Idaho	481
Pacific Gas Transmission Co	Washington	2,378	California	2,063
Utah				
Northwest Pipeline Corp	Colorado	337	Colorado	366

	Questar P L Co	Colorado	51	Wyoming	269
	Northwest Pipeline Corp	Idaho	298	Wyoming	360
	Kern River Gas Trans Co	Wyoming	831	Nevada	750
	Northwest Pipeline Corp	Wyoming	430	Colorado	310
	Questar P L Co	Wyoming	704	Colorado	23
Wyoming					
	Colorado Interstate Gas	Colorado	180	Colorado	625
	Questar P L Co	Colorado	165	Utah	703
	Trailblazer Pipeline Co	Colorado	500	Nebraska	500
	Colorado Interstate Gas	Montana	60	None	
	Williston Basin I P L Co	Montana	163	Montana	188
	Williston Basin I P L Co	South Dakota	26	None	
	Northwest Pipeline Corp	Utah	360	Utah	310
	Questar P L Co	Utah	269	Colorado	312
Washington					
	Ferndale P L Co	Canada	45	None	
	Northwest Pipeline Corp	Canada	1,066	Oregon	1,289
	Sumass international PI Co	Canada	15	None	
	Pacific Gas Transmission Co	Idaho	2,632	Oregon	2,378
	Northwest Pipeline Corp	Oregon	941	Idaho	122

Source: Energy Information Administration

Canada

Canada has approximately 73,000 miles of transmission pipelines to transport its natural gas production from processing plants to consumers and for exports to the United States. The major pipelines in the western region are TransCanada's British Columbia and Alberta system, Foothills (South British Columbia, Alberta and Saskatchewan systems), TransGas Limited (provincial Crown corporation, Saskatchewan) and the former Alliance Pipeline Limited (British Columbia, Alberta, and Saskatchewan to the United States border at Elmore North Dakota).

These pipelines not only serve Canada but export natural gas to the United States. For the WIEB Region the Huntington (British Columbia to Washington), Kingsgate (Alberta to Idaho), Monchy (Saskatchewan to Montana) and the critical transfer & metering stations along the boarder.

Natural Gas Market Centers/Hubs

The creation of market centers and hubs came about in the late 1980's because of deregulation of the natural gas market when the Federal Energy Regulatory Commission's (FERC) issued Order 636. FERC Order 636 required that interstate natural gas pipeline companies transform themselves from buyers and sellers of natural gas to strictly natural gas transporters. The implementation of this Order and the subsequent reorganization of the industry saw the development of Market Centers or Hubs. The development of these centers evolved to provide the market with many of the services and capabilities once handled by the interstate pipeline companies.

The defining characteristics of a natural gas hub are:

1. To provide customers with receipts/delivery access to two of more pipeline systems.
2. To provide transportation between the pipelines and/or transfer gas ownership.

Hubs provide the services that customers (shippers) require to manage their portfolio of supply, transportation, and storage; services previously provided by the interstate pipeline companies. The location of Hubs increases the interchange of natural gas across pipeline systems and permits the development of markets for the trading of natural gas. In the United States and Canada there are currently 37 operational Hubs, **Table MC-1: Natural Gas Market Centers/Hubs,** 28 in the United States and nine in Canada**. Figure MC-1 Gas Market Centers/Hubs and Production Region** not only shows the market centers but it indicates the major pipeline corridors showing the movement of natural gas from producing basins to end users.

The WIEB region has eight Hubs in the United States: Colorado (1), Wyoming (1), New Mexico (1), California (2), Idaho (1), and Oregon (2)). Canada has eight of its nine Hubs located in the WIEB Provinces: Alberta (7) and British Columbia (1).

Wellhead Price

The U.S. wellhead price is the price received by natural gas producers for marketed gas. The produced natural gas includes nonmethane natural gas liquids that are removed by separation plants near the point of production. The resulting "dry" natural gas, which is predominantly methane, is then ready for transport to end users. Natural gas is normally not traded at the wellhead, but after natural gas liquids are removed. The natural gas price at the market centers, represents the current market price for dry natural gas in that area.

Henry Hub located in Louisiana is the most active and publicized market center in North America. Henry Hub interconnects nine interstate and four intrastate pipelines. Collectively, these pipelines provide access to markets in the Midwest, Northeast, Southeast, and Gulf Coast. Approximately, 49 percent of U.S.

wellhead production either occurs near the Henry Hub or passes close to Henry Hub as it moves to downstream markets.

Table MC-1: Natural Gas Market Centers and Hubs

Region/ State/ Province	Market Center	Administrator	Year Started	Type of Operation	Estimated Throughput Capacity (MMcf/d)	Pipeline Inter-connections	Storage			
							Type	Number of Sites	Estimated Working Capacity	Estimated Total Daily Deliverability (MMcf/d)
Central										
Colorado	Cheyenne Hub	Colorado Interstate Gas Co	2000	Market Hub	1,155	5	Depleted Fields	3	22	450
Wyoming	Opal Hub	Williams Field Services Co	1999	Production Hub	1,100	3		0		
Kansas	Mid-Continent Center	Oneok Gas Transportation LLC	1995	Market Center	230	12	Depleted Fields	2	5	81
Midwest										
Illinois	ANR Joliet	ANR Pipeline Co	2003	Market Center	1,000	10	Linepack	0		
Illinois	Chicago	Enerchange Inc.	1993	Market Center	450	7	Mixed	7	143	2,800
Northeast										
New York	Iroquis	Iroquois Gas Trans Co	1996	Market Center	1,200	4	Linepack	0		
Pennsylvania	Dominion	Dominion Transmission Inc.	1994	Market Center	1,022	16	Depleted Fields	12	366	7,120
Pennsylvania	Ellisburg-leidy	National Fuel Gas Supply Co	1993	Market Center	520	7	Depleted Fields	13	104	1,831
Southwest										
Louisiana	Egan Hub	Egan Hub Partners LP	1995	Market Hub	1,200	7	Salt Dome	1	14	1,200
Louisiana	Henry Hub	Sabine Hub Services Inc.	1988	Market Hub	1,825	14	Salt Dome	2	15	1,390
Louisiana	Nautilus Hub	Shell Gas Transmission Co	2000		600	8		0		
Louisiana	Perryville Center	Centerpoint Energy Gas Tran Co	1994	Market Center	600	11	Depleted Fields	4	97	1,876
New Mexico	Blanco Hub	Transwestern Gas pipeline Co	1993	Market Center	850	9	Linepack	0		
East Texas	Agua Duice Hub	ConocoPhillips Inc	1990	Production Hub	425	9		0		
East Texas	Carthage Hub	Duke Energy Field Services Co	1990	Market Hub	335	14		0		
East Texas	Katy (DEFS) Hub	Duke Energy Field Services Co	1995	Market Hub	500	8		0		
East Texas	Katy Storage Hub	Enstor Inc	1993	Market Hub	700	13	Mixed	2	21	700

Table MC-1: Natural Gas Market Centers and Hubs

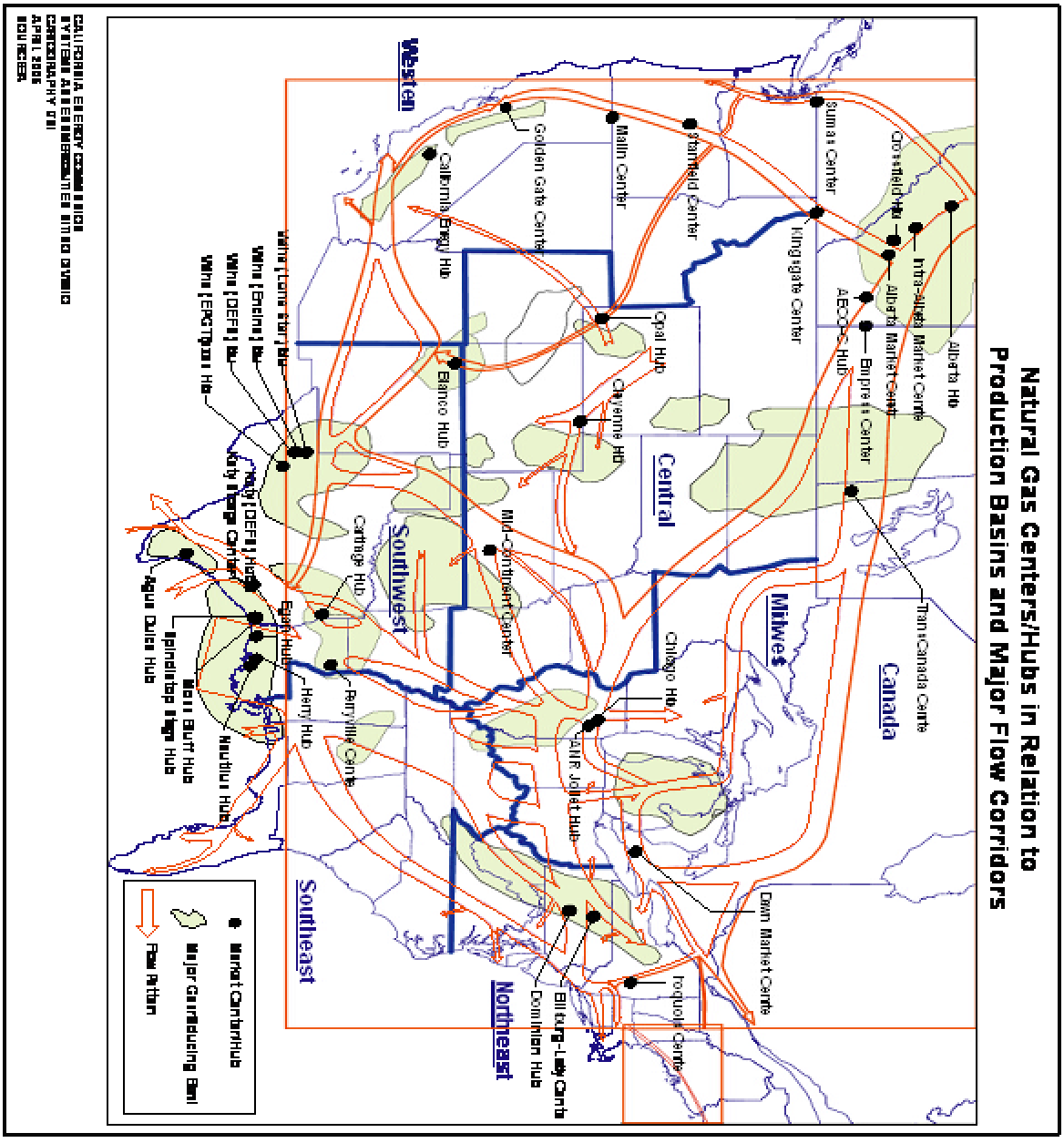
Region/ State/ Province	Market Center	Administrator	Year Started	Type of Operation	Estimated Throughput Capacity (MMcf/d)	Pipeline Inter-connections	Storage			
							Type	Number of Sites	Estimated Working Capacity	Estimated Total Daily Deliverability (MMcf/d)
East Texas	Moss Bluff Hub	Moss Bluff Hub Partners LP	1994	Market Hub	1,200	5	Salt Dome	1	12	1,200
East Texas	Spindletop Storage Hub	Centana Intrastate Pipeline Co	1998	Market Hub	750	6	Salt Dome	1	9	750
West Texas	Waha (EPGT) Hub	El Paso Texas Pipeline LP	1995	Market Hub	300	10	Salt Dome	1	7	800
West Texas	Waha (DEFS) Hub	Duke Energy Field Services Co	1995	Market Hub	450	7		0		
West Texas	Waha (Encina) Hub	Sid Richardson Gas Co	1995	Production Hub	200	10		0		
West Texas	Waha (Lone Star) Hub	TXU Lone Star Gas Co	1995	Market Hub	650	11	Salt Dome	1	7	800
Western										
California	California Energy Hub	Southern California Gas Co	1994	Market Center	2,120	5	Depleted Fields	4	47	2,995
California	Golden Gate Center	Pacific Gas & Electric	1996	Market Center	2,020	8	Depleted Fields	5	125	2,405
Idaho	Kingsgate Center	PG&E Gas Transmission – NW	1994	Market Hub	2,970	2	Linepack	0		
Oregon	Malin Center	PG&E Gas Transmission – NW	1994	Market Hub	2,405	4	Linepack	0		
Oregon	Stanfield Center	Pacific Gas Transmission Co	1994	Market Hub	880	2	Linepack	0		
Canada										
Alberta	AECO-C	EnCana Energy Co	1990	Market Center	12,000		Depleted Field	3	100	2,415
Alberta	Alberta Hub	Enstor – PPM Energy Ltd	1997	Market Hub	650		Depleted Field	1	35	650
Alberta	Albert Centre	Alco Gas Services Ltd	1998	Market Hub	550	3	Depleted Field	1	40	580
Alberta	Crossfield	Crossalta Gas Storage & Dervices	1995	Market Hub	450		Depleted Field	1	45	450
Alberta	Empress	Transcanada Gas Pipeline Ltd	1986	Market Hub	6,500	2		0		
Alberta	Intra-Alberta	Transcanada Gas Pipeline Ltd	1994	Market Center	2,000			0		
British Columbia	Sumsa	Westcoast Pipeline Co	1994	Market Hub	700	5	Depleted Field	1	80	550
Alberta/Quebec	TransCan-ada	Transcanada Gas Pipeline Ltd	1998	Market Hub	6.5	16		0		

Table MC-1: Natural Gas Market Centers and Hubs

Region/ State/ Province	Market Center	Administrator	Year Started	Type of Operation	Estimated Throughput Capacity (MMcf/d)	Pipeline Inter-connections	Storage			
							Type	Number of Sites	Estimated Working Capacity	Estimated Total Daily Deliverability (MMcf/d)
Ontario	Cawn	Union Gas Ltd	1985	Market Center	2,600	6	Depleted Field	20	135	1,173

Source: Energy Information Administration

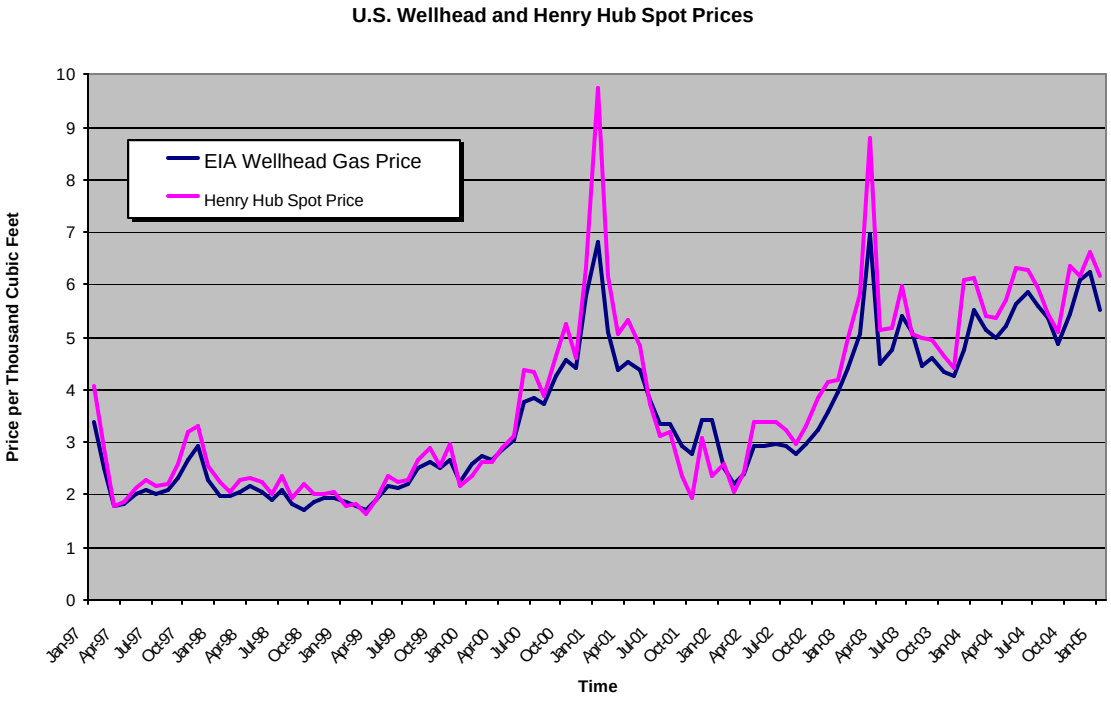
Figure MC-1 Gas Market Centers/Hubs and Production Region



Henry Hub is important because the absence of "real- time" wellhead natural gas prices has resulted in the industry searching for a way to monitor real-time natural gas prices. The market has accepted Henry Hub spot for next day delivery as a proxy measure for the current wellhead price. Henry Hub is the largest centralized point for natural gas spot and futures trading in the United States.

The graph of Henry Hub spot prices and United States average wellhead prices for natural gas from January 1995 through December 2000, **Figure MC-2: Natural Gas Wellhead Price,** indicates that wellhead price does track the Henry Hub spot price. Henry Hub's price will normally be slightly higher that the wellhead price since some transportation costs are incurred in moving the natural gas from the field to the market center.

Figure MC-2: Natural Gas Wellhead Price



Sources: EIA and NGI

End User Market Price

The market price that the end users pay consists of three main elements: the wellhead price (natural gas producers), gathering and transmission costs (interstate and intrastate pipeline), and the distribution cost associated with the local distribution system. For many years the cost associated with the local distribution system has been the major cost element to the residential end users, as seen in **Table MC-2, Average Annual Residential Price**. The increase in wellhead price that has occurred in recent years has been the major reason for the natural gas price increases over the last few years.

The wellhead price increased by 11.5 percent annually since, 1992 while the transmission cost increased 1.4 percent annually, and the local distribution cost increased 3.6 percent annually.

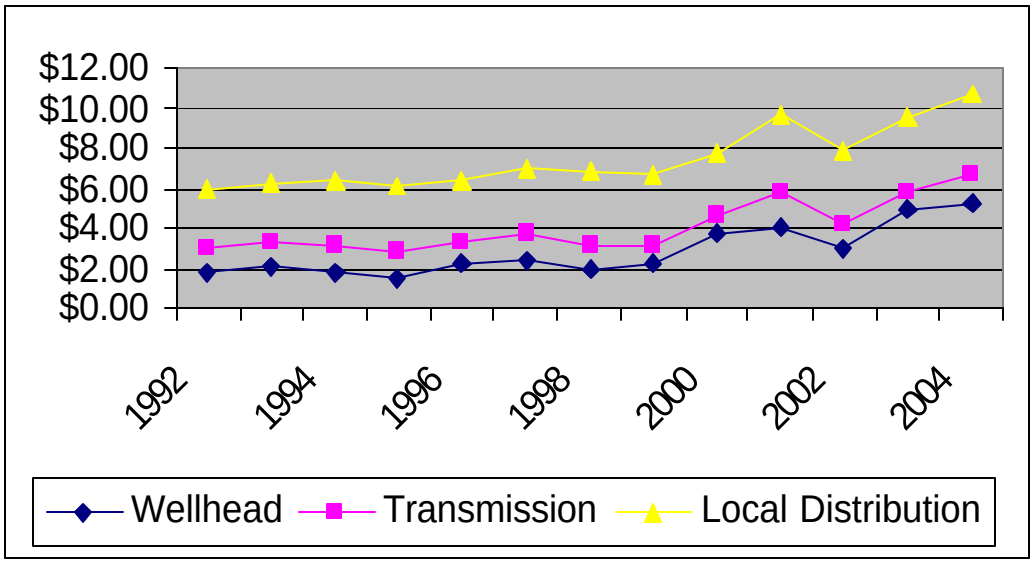
As shown in **Figure MC-3, Average Annual Residential Price,** the transmission cost associated with the interstate and intrastate movement and the local distribution costs have been fairly constant. The wellhead price has been the pricing component that has caused the greatest rise in the end user market.

Table MC-2, Average Annual Residential Price, Dollars per Thousand Cubic Feet

	Wellhead	Transmission	Local Distribution	Residential Price
1992	$1.74	$1.27	$2.88	$5.89
1993	$2.04	$1.17	$2.95	$6.16
1994	$1.85	$1.22	$3.34	$6.41
1995	$1.55	$1.23	$3.28	$6.06
1996	$2.17	$1.10	$3.07	$6.34
1997	$2.32	$1.34	$3.28	$6.94
1998	$1.96	$1.11	$3.75	$6.82
1999	$2.19	$0.91	$3.59	$6.69
2000	$3.68	$0.94	$3.14	$7.76
2001	$4.00	$1.72	$3.91	$9.63
2002	$2.95	$1.17	$3.77	$7.89
2003	$4.88	$0.97	$3.67	$9.52
2004	$5.19	$1.46	$4.09	$10.74

Source: Energy Information Administration

Figure MC-3, Average Annual Residential Price, Dollars per Mcf



Source: Energy Information Administration

Table MC-3 Average Annual End User Natural Gas Price indicates the average natural gas price paid in the various states and by different end users. The electrical generators and large industrial users have a lower price. Many of these end users are located along interstate and intrastate pipeline systems and take there natural gas directly from these carriers. This allows these end users to avoid the local distribution costs associated with the residential and commercial end users.

Table MC-3 Average Annual End User Natural Gas Price

State	Well Head	City Gate	Residual	Commercial	Industrial	Generators
Alabama	$5.93	$6.06	$11.81	$10.07	$6.64	$5.80
Alaska	$2.41	$2.33	$4.39	$3.58	$1.75	$2.33
Arizona	$4.33	$4.87	$11.31	$7.84	$6.54	$5.14
Arkansas	$5.17	$6.07	$10.33	$7.67	$6.94	$4.37
California	$5.04	$5.16	$9.13	$8.15	$7.19	$5.49
Colorado	$4.54	$4.11	$6.61	$5.93	$4.46	$4.38
Connecticut		$5.95	$1.77	$10.47	$7.52	
Delaware		$5.88	$10.53	$9.05	$6.37	
Florida		$5.87	$16.17	$10.39	$6.82	$5.87
Georgia		$6.25	$11.88	$9.92	$6.77	$5.87
Hawaii		$8.63	$27.27	$19.51	$11.82	
Idaho		$4.27	$7.59	$6.93	$5.90	
Illinois		$5.97	$9.64	$8.26	$7.23	$6.06
Indiana	$5.41	$6.19	$9.40	$8.42	$8.34	$5.85
Iowa		$6.19	$9.14	$7.71	$6.50	$5.91
Kansas	$4.33	$5.97	$8.95	$8.50	$4.96	$5.32
Kentucky	$4.54	$6.11	$9.18	$8.62	$6.54	
Louisiana	$5.64	$5.78	$10.20	$8.70	$5.53	$5.93
Maine		$7.45	$12.77	$11.39	$9.74	$6.22
Maryland	$4.50	$6.87	$11.01	$8.12	$9.57	$6.71
Massachusetts		$7.37	$12.48	$10.48	$7.20	$5.51
Michigan	$4.01	$5.32	$7.31	$6.93	$5.52	$3.91
Minnesota		$6.04	$8.58	$7.60	$5.86	
Mississippi	$5.13	$6.19	$9.74	$7.74	$6.35	$5.81
Missouri		$6.12	$9.49	$8.53	$7.93	
Montana	$3.73	$5.04	$7.08	$7.08	$4.41	$5.89
Nebraska	$3.17	$5.70	$7.83	$6.90	$5.86	$5.13
Nevada		$5.67	$8.58	$7.29	$8.68	$5.31
New Hampshire		$6.91	$9.74	$10.30	$9.52	
New Jersey		$7.16	$8.51	$8.74	$7.29	$6.43
New Mexico	$4.56	$4.78	$8.41	$6.89	$5.48	
New York	$5.78	$5.73	$11.58	$8.59	$7.35	$6.21
North Carolina		$6.75	$11.48	$9.79	$6.28	$5.81
North Dakota	$3.53	$5.79	$7.25	$6.89	$6.22	
Ohio	$5.90	$5.64	$9.16	$8.12	$8.06	$6.19
Oklahoma	$4.97	$5.87	$8.89	$8.36	$7.46	$5.55
Oregon	$4.48	$5.19	$9.84	$7.91	$5.84	$4.53
Pennsylvania		$6.48	$10.87	$9.32	$8.12	$6.58
Rhode Island		$7.00	$11.85	$10.34	$8.19	$6.72
South Carolina		$6.71	$11.02	$9.60	$6.83	

South Dakota		$1.98		$6.07		$8.49		$7.12		$5.78	
Tennessee		$5.22		$5.96		$9.64		$8.88		$6.32	
Texas		$5.18		$5.53		$9.22		$7.59		$5.36	$5.47
Utah		$4.11		$4.74		$7.33		$5.95		$5.04	$3.89
Vermont				$5.17		$10.05		$8.00		$4.97	
Virginia				$6.57		$11.84		$9.47		$5.97	$6.23
Washington				$5.13		$8.43		$7.38		$6.05	$4.17
West Virginia				$5.69		$8.92		$8.05		$6.76	$6.84
Wisconsin				$6.18		$9.27		$7.97		$7.23	$5.77
Wyoming		$4.13		$2.52		$7.14		$5.69		$6.12	$3.57

Source: Energy Information Administration

Natural Gas Consumption By End Use

End Use Consumption

Natural gas consumption has been divided in to four consuming groups: residential, commercial, industrial, and electric power.

Residential consumption is the natural gas used in private dwellings, including apartments, for heating, cooking, water heating, and other household uses.

Commercial consumption is the natural gas used by nonmanufacturing establishments primarily engaged in the sale of goods or services such as hotels, restaurants, wholesale and retail stores and other services enterprises; and gas used by local state and federal agencies engaged in nonmanufacturing activities.

Industrial consumption is the use of natural gas for heat, power, or chemical feedstock by manufacturing establishments or those engaged in mining or other mineral extraction as well as consumers in agriculture, forestry, fisheries and construction.

Electric power consumption is the use of natural gas as fuel in the electric power sector.

Natural gas consumption in the WIEB states was approximately 20 percent of that consumed in the lower 48 states, **Table C – 1, Consumption Of Natural Gas By States – 2002, Million Cubic Feet.** California is the largest consumer in the region and accounted for approximately half of the region's consumption, which varies considerably during the year, by as much as 175 percent, **Figure C-1, Natural Gas Consumption Western WIEB States**.

In the WIEB region the electric power group is the largest consumer of natural gas consuming approximately 2.1 Trillion cubic feet (Tcf) of natural gas in 2002; this was followed by the industrial sector at 1.5 Tcf, residential sector at 0.9 Tcf and commercial sector at 0.5Tcf.

The electric power and residential sectors have the greatest swings in natural gas demand. The residential demand is highest in the winter months throughout the region, **Figure C- 2, Residential Consumption, Million Cubic Feet per Month**.

The commercial sector has a similar pattern but the volume consumed in this sector is only 10 percent of region's demand. Therefore, the swing in consumption does not have a significant impact on the distribution system, **Figure C – 3, Commercial Consumption, Million Cubic Feet per Month.**

Table C – 1, Consumption Of Natural Gas By States – 2002, Million Cubic Feet per Month

States	Delivered to Consumers		Percent of Lower 48 States
Alabama	340,925		1.6%
Arizona	230,374		1.1%
Arkansas	233,046		1.1%
California	2,218,924		10.5%
Colorado	409,504		1.9%
Connecticut	175,072		0.8%
D.C.	32,656		0.2%
Delaware	52,167		0.2%
Florida	691,075		3.3%
Georgia	375,567		1.8%
Idaho	65,040		0.3%
Illinois	1,036,437		4.9%
Indiana	533,754		2.5%
Iowa	215,466		1.0%
Kansas	239,044		1.1%
Kentucky	210,263		1.0%
Louisiana	1,194,118		5.7%
Maine	100,659		0.5%
Maryland	193,766		0.9%
Massachusetts	388,972		1.8%
Michigan	926,300		4.4%
Minnesota	348,523		1.7%
Mississippi	312,237		1.5%
Missouri	272,700		1.3%
Montana	58,451		0.3%
Nebraska	117,429		0.6%
Nevada	175,739		0.8%
New Hampshire	24,841		0.1%
New Jersey	597,158		2.8%
New Mexico	122,917		0.6%
New York	1,190,745		5.6%
North Carolina	229,338		1.1%
North Dakota	42,569		0.2%
Ohio	815,051		3.9%
Oklahoma	429,141		2.0%
Oregon	193,006		0.9%
Pennsylvania	631,111		3.0%
Rhode island	87,472		0.4%
South Carolina	184,422		0.9%
South Dakota	28,379		0.1%
Tennessee	243,955		1.2%
Texas	3,963,152		18.8%
Utah	135,699		0.6%
Vermont	8,353		0.0%
Virginia	247,351		1.2%
Washington	227,360		1.1%
West Virginia	103,081		0.5%
Wisconsin	381,498		1.8%
Wyoming	69,633		0.3%
Total 48 States	21,104,440		

Source: Energy Information Administration

Figure C-1, Natural Gas Consumption Western WIEB States, Million Cubic Feet Per Month

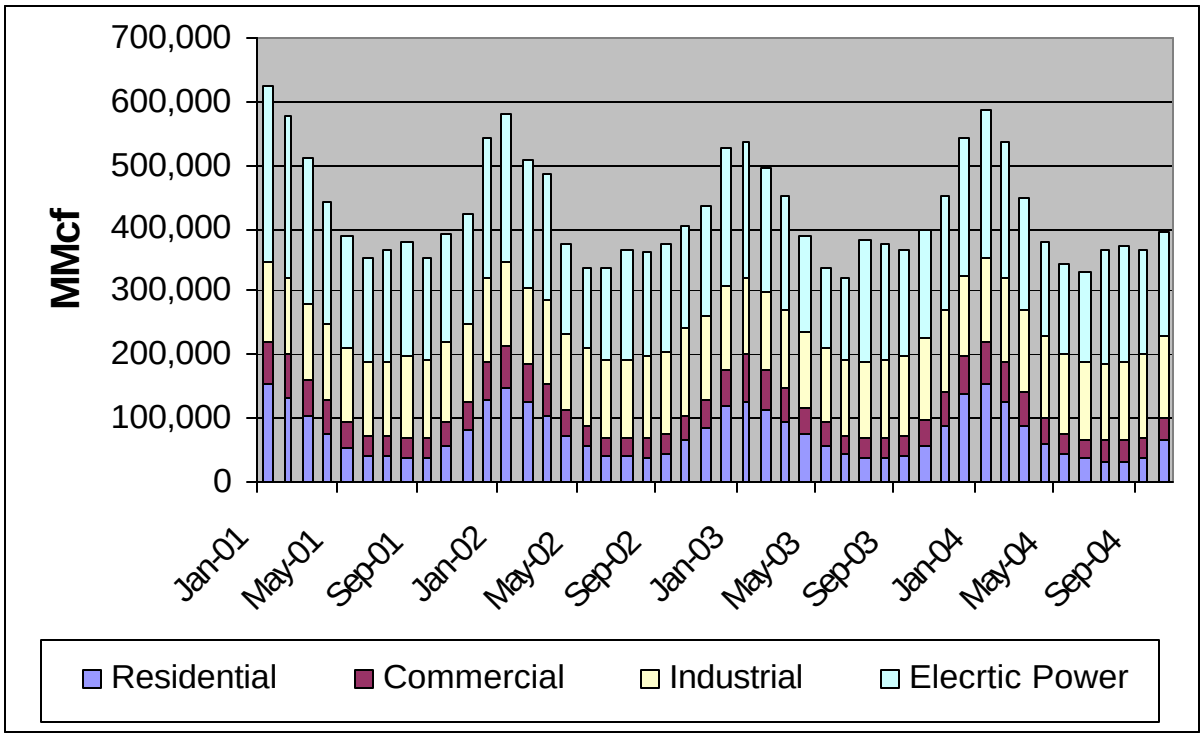


Figure C- 2, Residential Consumption, Million Cubic Feet per Month

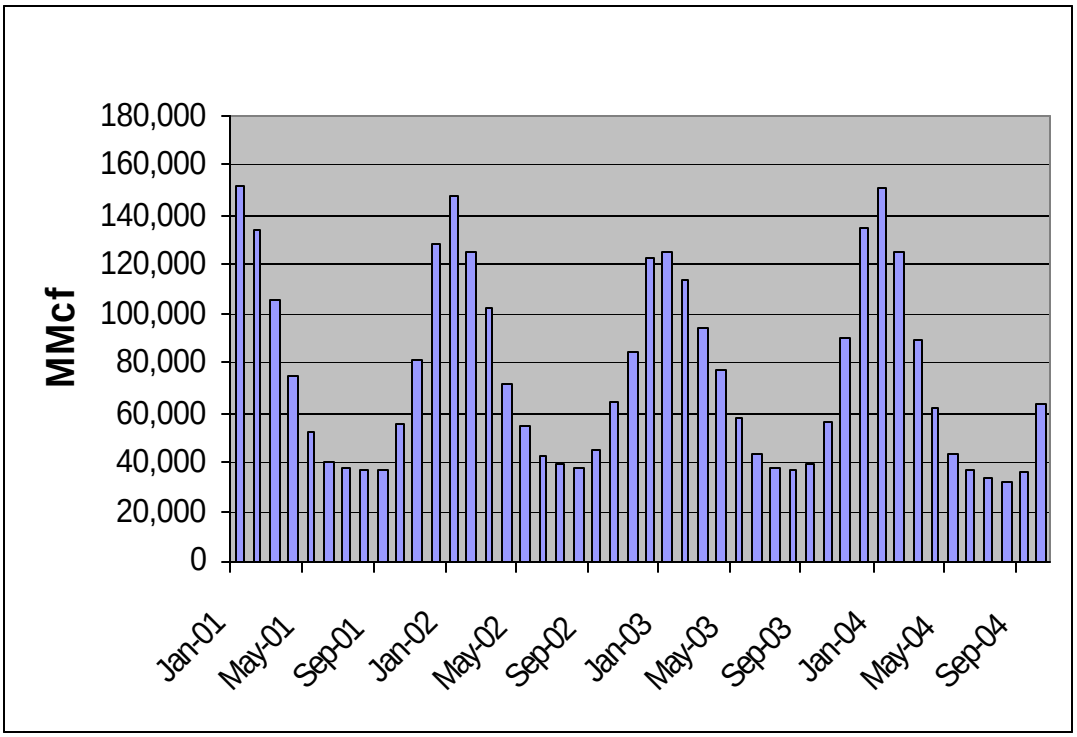
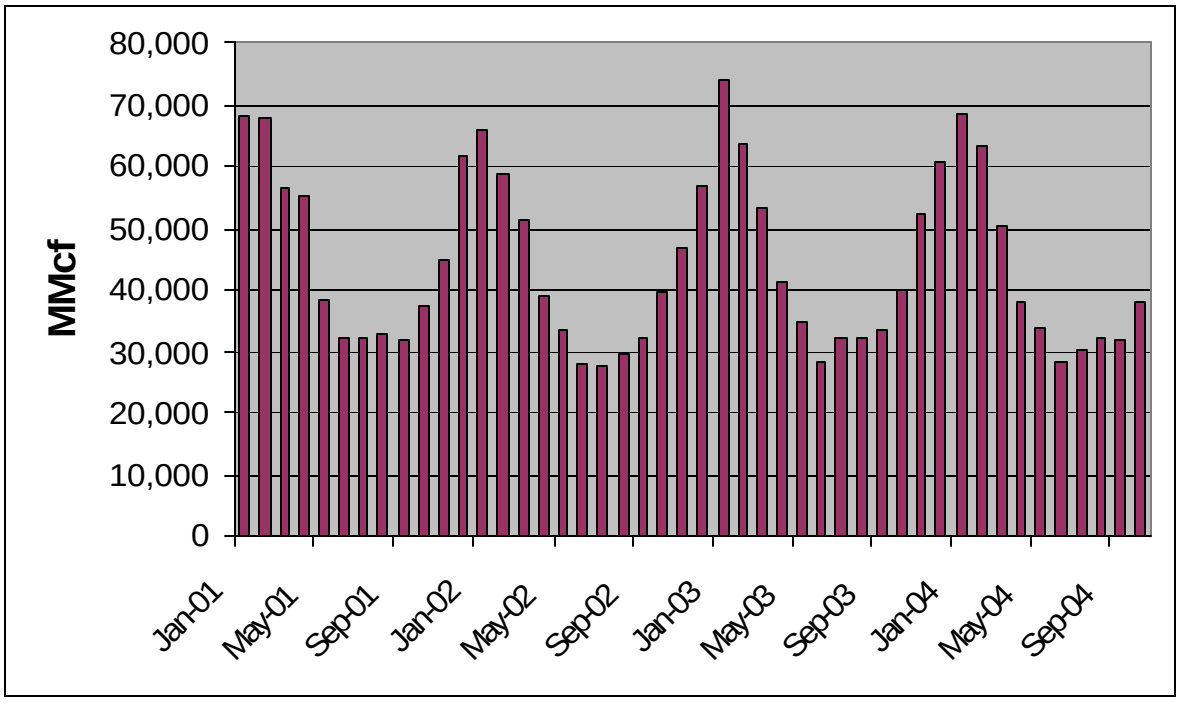
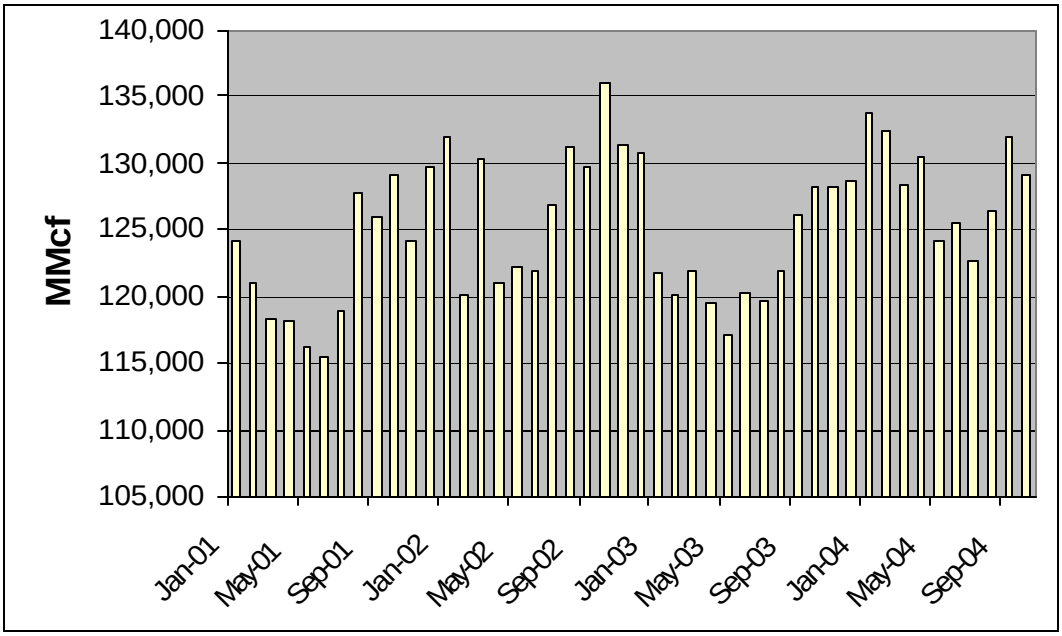


Figure C – 3, Commercial Consumption, Million Cubic Feet per Month



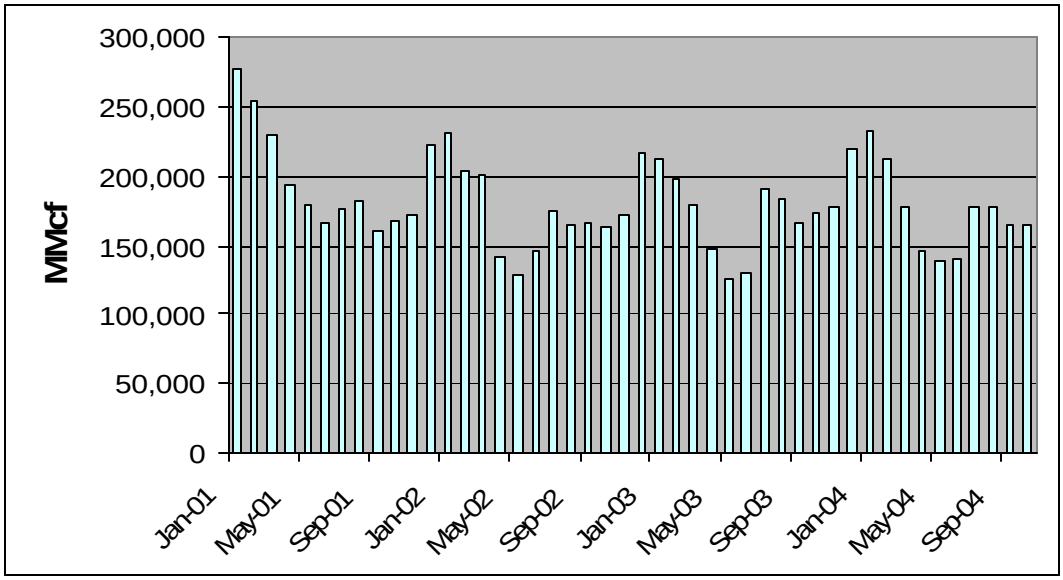
The industrial sector **Figure C – 4, Industrial Consumption, Million cubic Feet per Month** consumes approximately 30 percent of the region's natural gas. Natural gas consumption in this sector is fairly consistent and less affected by weather. The swing in use over the year is approximately 15 MMcf per month.

Figure C – 4, Industrial Consumption, Million cubic Feet per Month



The electric power sector consumes approximately 42 percent of the region's natural gas, **Figure C – 5, Electric Power Consumption, Million Cubic Feet per Month**. It is this sector that can put the greatest stress on the natural gas distribution system. This is due to the volume of natural gas required but also the swings in natural gas demand by the sector. Natural gas consumption for the electric power sector has varied by 100,000 MMcf per month.

Figure C – 5, Electric Power Consumption, Million Cubic Feet per Month



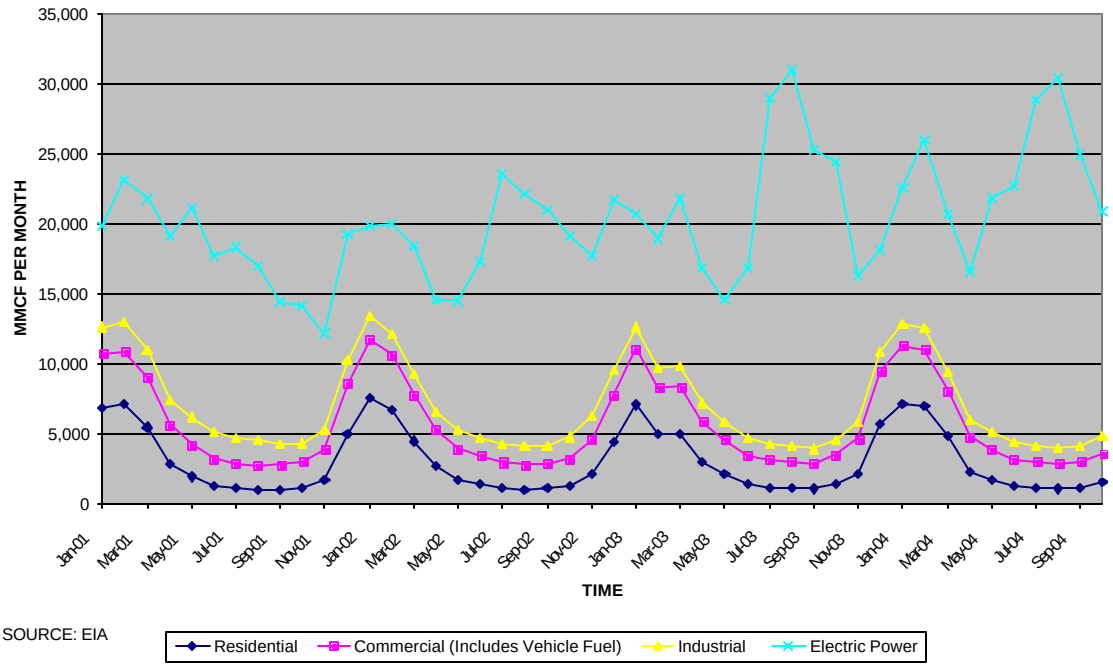
Arizona – Consumption by End Use

In 2002, Arizona consumed approximately 230 billion cubic feet of natural gas. Residential demand accounted for 15.4 percent of this total consumption. Industrial, commercial, and electric generation accounted for 13.8 percent, 7.5 percent, and 63.3 percent, respectively.

Seasonal consumption patterns are the strongest in residential, commercial and industrial sectors. In these sectors, consumption peaks during winter months and then declines to their minimal levels during summer months. Electric generators, on the other hand, experience peak consumption during summer-months and troughs during winter-months.

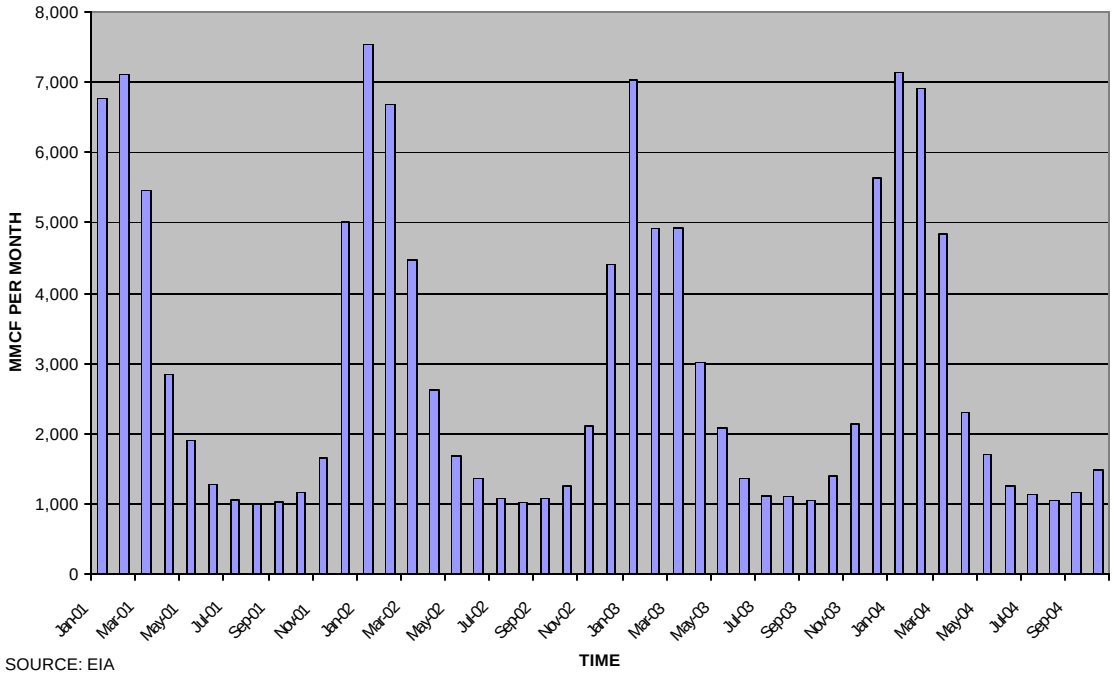
Growth rates for each of these sectors vary considerably. Residential and commercial sectors experienced growth rates of 1.1 percent and 1.3 percent, per year from 1991 to 2002. Sufficient historical data is unavailable over the time period for the industrial and the electric generators to calculate annual growth rates.

ARIZONA NATURAL GAS CONSUMPTION BY END USERS



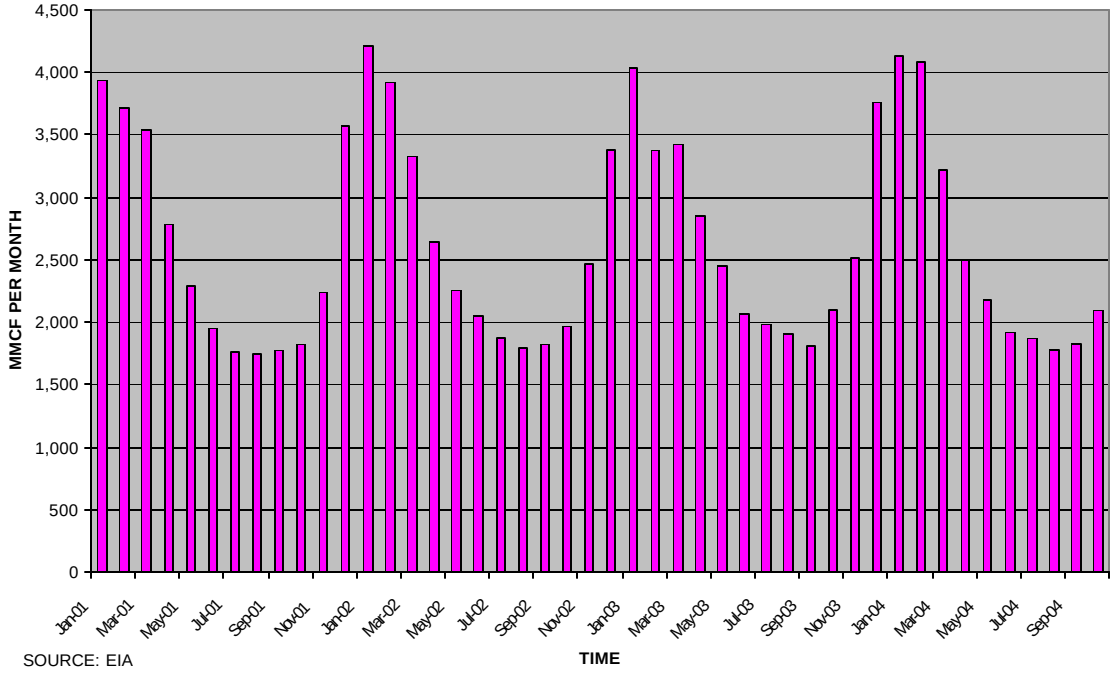
SOURCE: EIA

ARIZONA-RESIDENTIAL



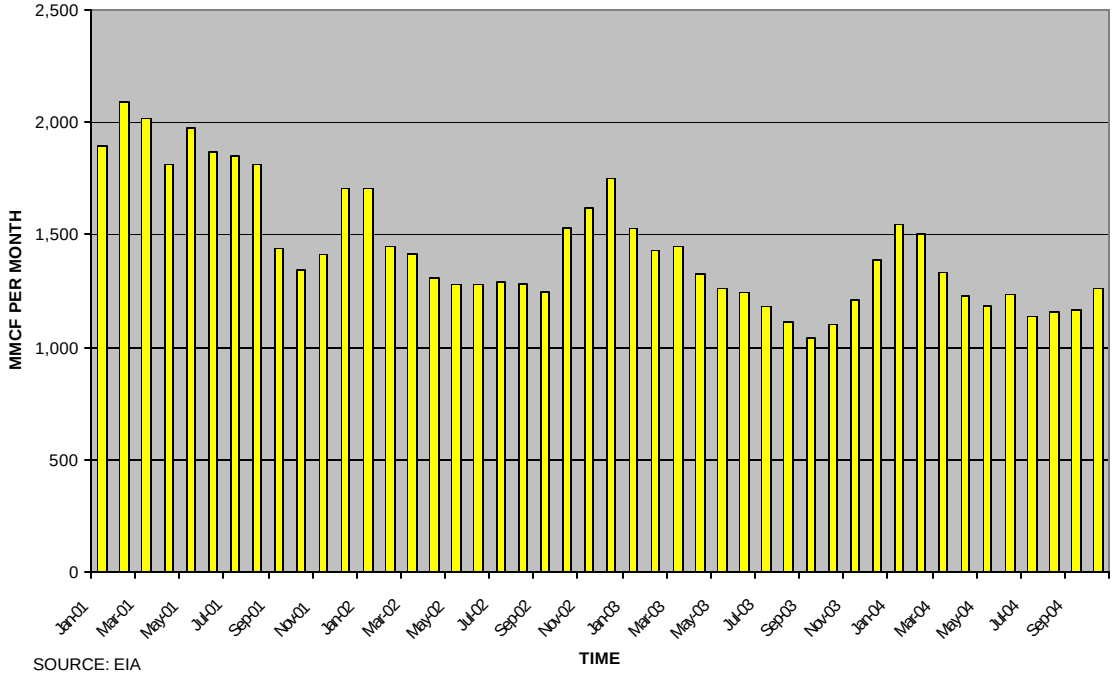
SOURCE: EIA

ARIZONA-COMMERCIAL



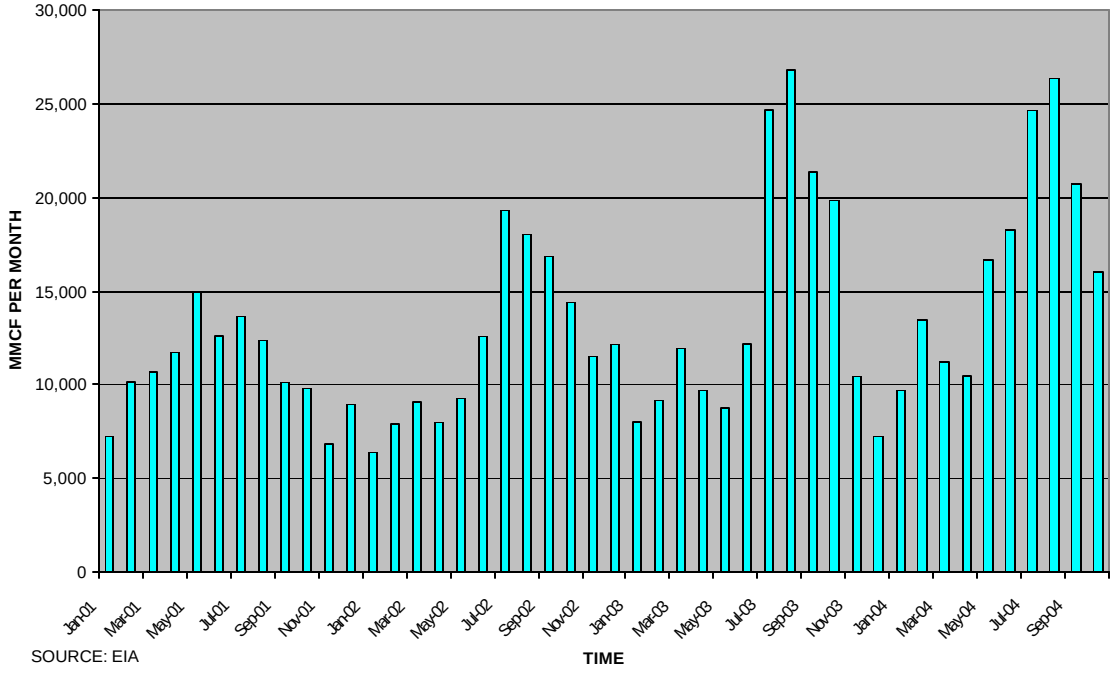
SOURCE: EIA

ARIZONA-INDUSTRIAL



SOURCE: EIA

ARIZONA-ELECTRIC POWER



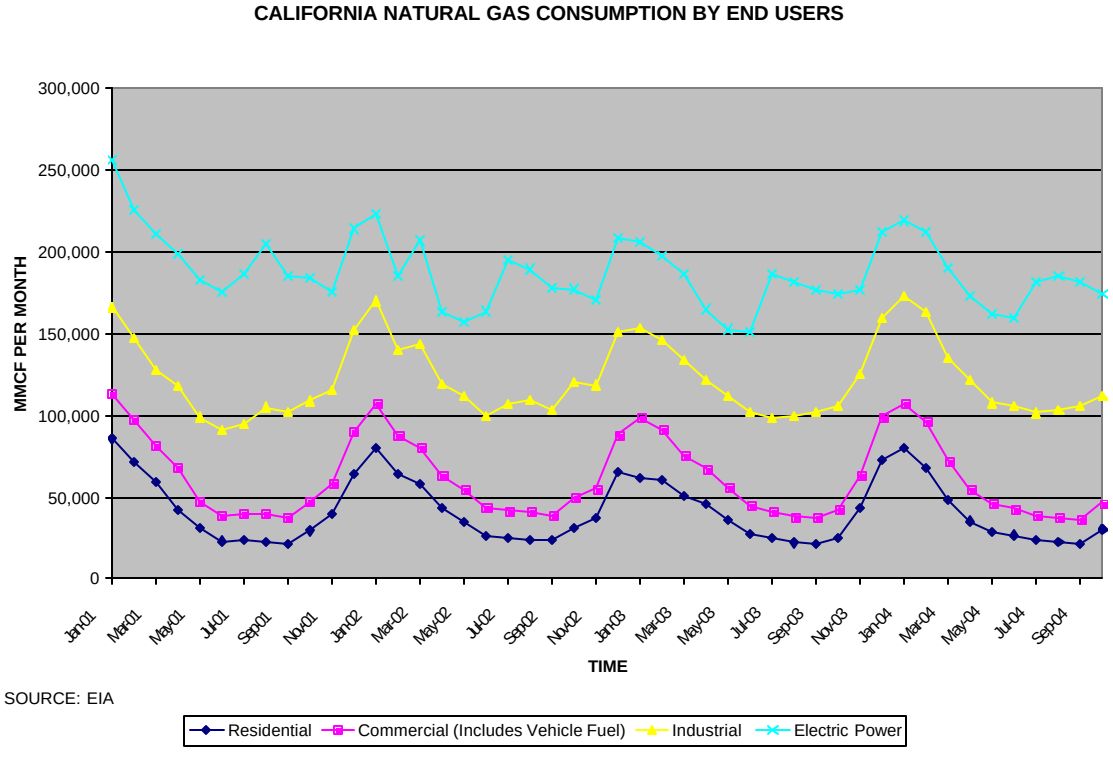
SOURCE: EIA

California – Consumption by End Use

In 2002, California consumed 2.2 trillion cubic feet of natural gas. The majority of that total was consumed by the industrial, and the electric generation sectors, which came to 33.4 percent and 32.8 percent. In contrast, the Commercial sector accounted for 10.8 percent and the residential sector accounted for 23.1 percent of the total.

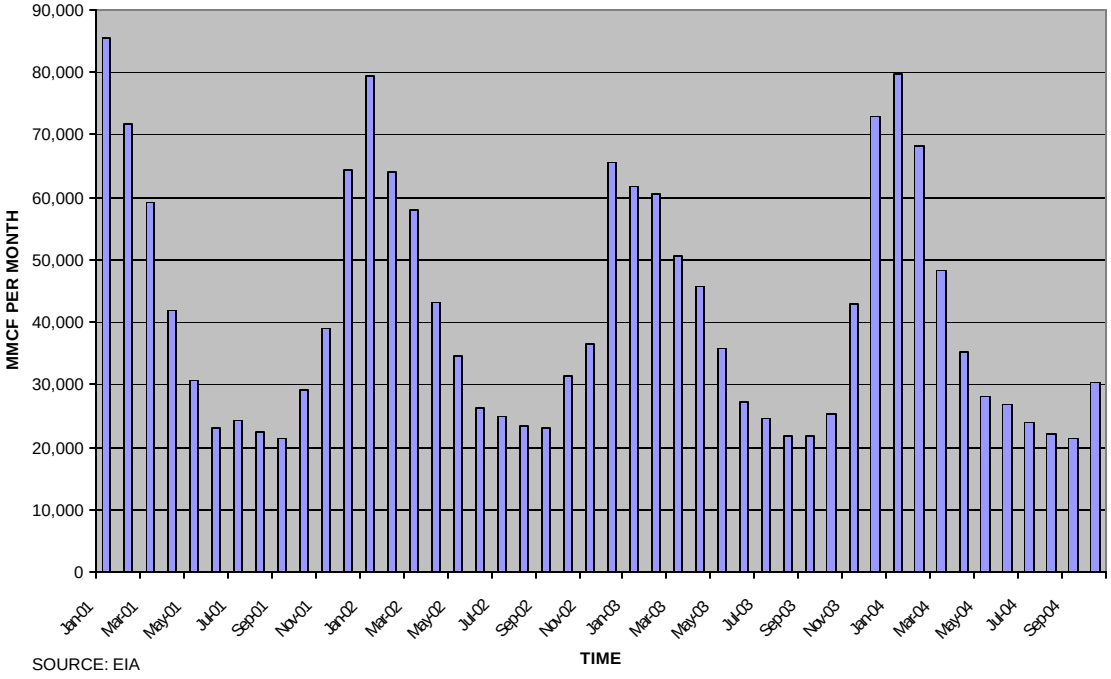
Three out of four end use sectors experienced seasonal patterns of natural gas use. Of these, only two end use sectors experienced similar patterns of consumption. Residential, and Commercial users have peak consumption during winter months and troughs during summer months. The electric generators, in contrast, consume the majority of their annual consumption during summer months and smaller amounts during winter months. The industrial sector has no pattern to its peaks and troughs.

Residential sector demand has grown less that half of one percent per year from 1991 to 2002. Commercial demand during this period has declined by 1.7 percent per year. Due to insufficient data on the remaining two sectors (industrial and electric generation), growth rates could not be calculated. However, as per the monthly consumption graph below for electric generation, growth seems to be flat from January of 2001 to October of 2004. In contrast, the industrial sector has experienced growth in natural gas use from January of 2001 to October of 2004.



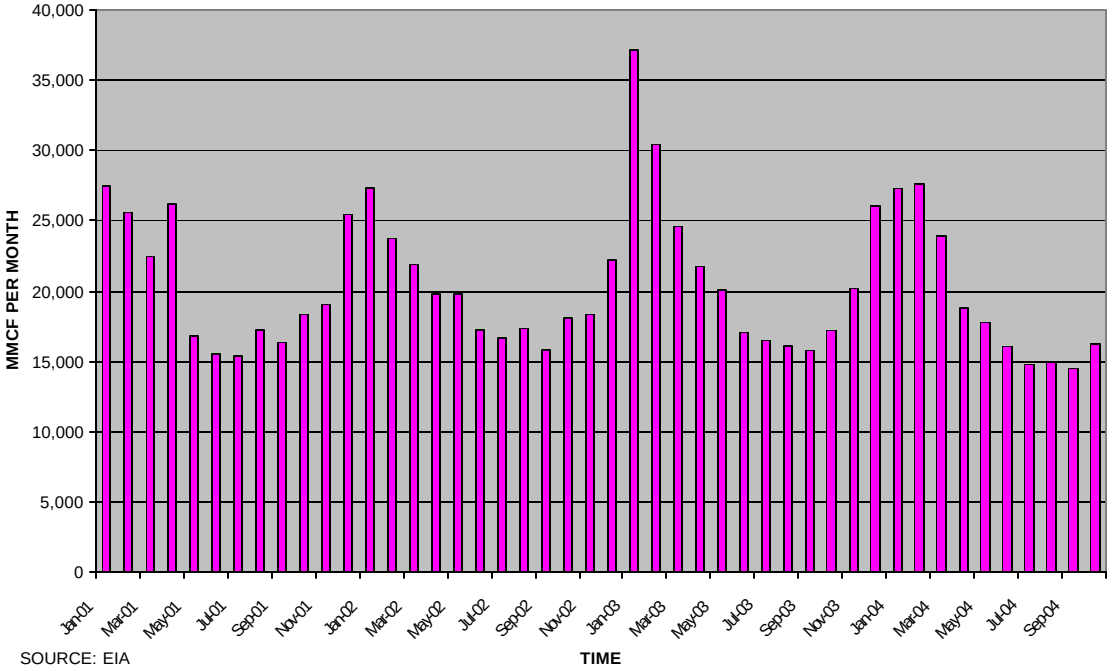
SOURCE: EIA

CALIFORNIA-RESIDENTIAL



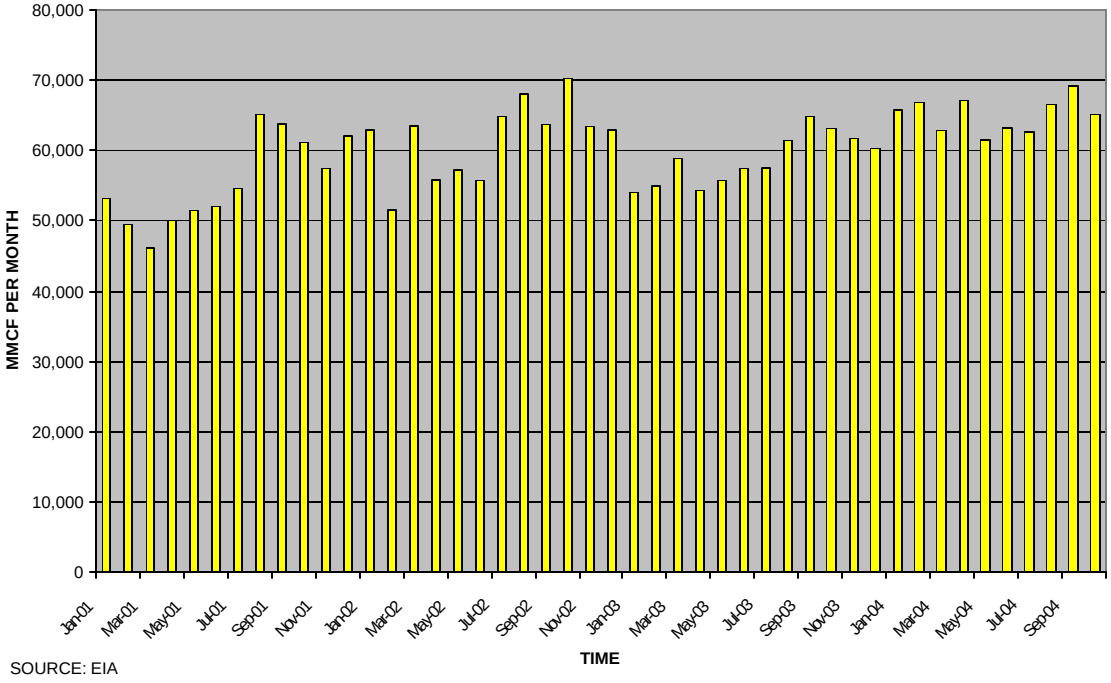
SOURCE: EIA

CALIFORNIA-COMMERCIAL



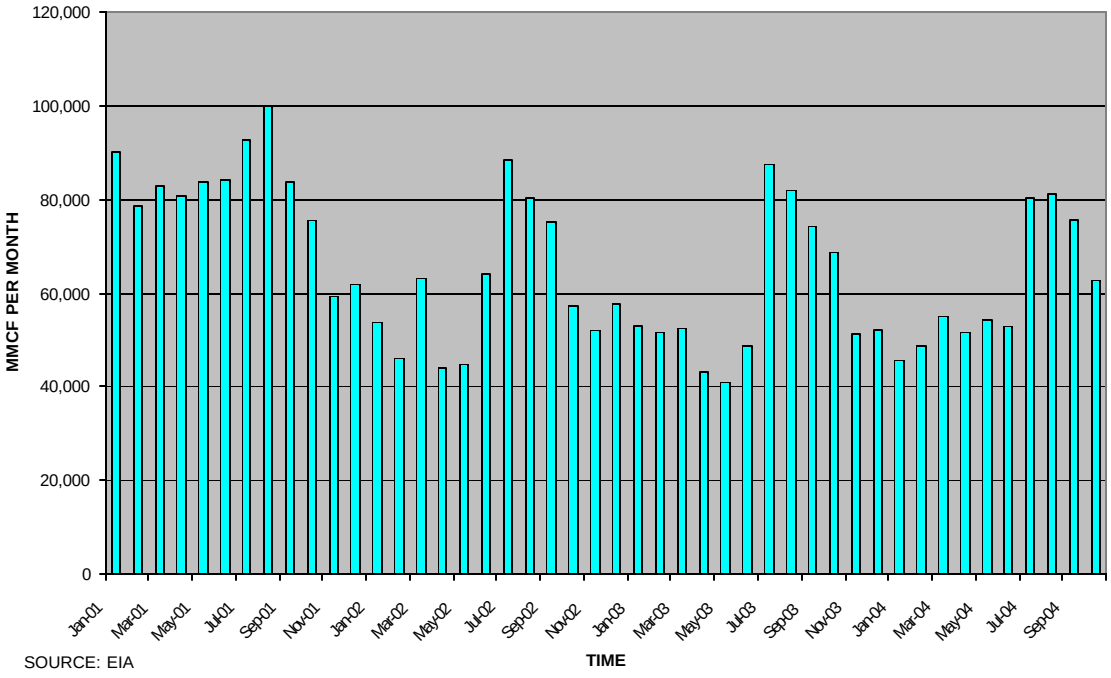
SOURCE: EIA

CALIFORNIA-INDUSTRIAL



SOURCE: EIA

CALIFORNIA-ELECTRIC POWER



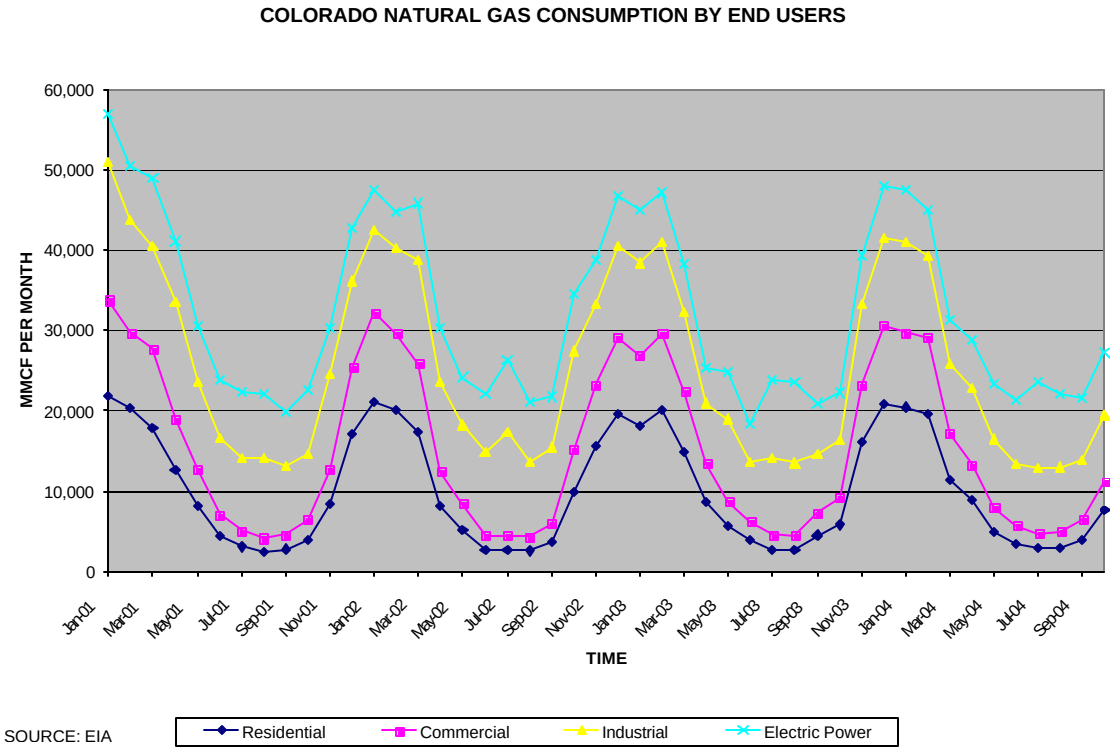
SOURCE: EIA

Colorado – Consumption by End Use

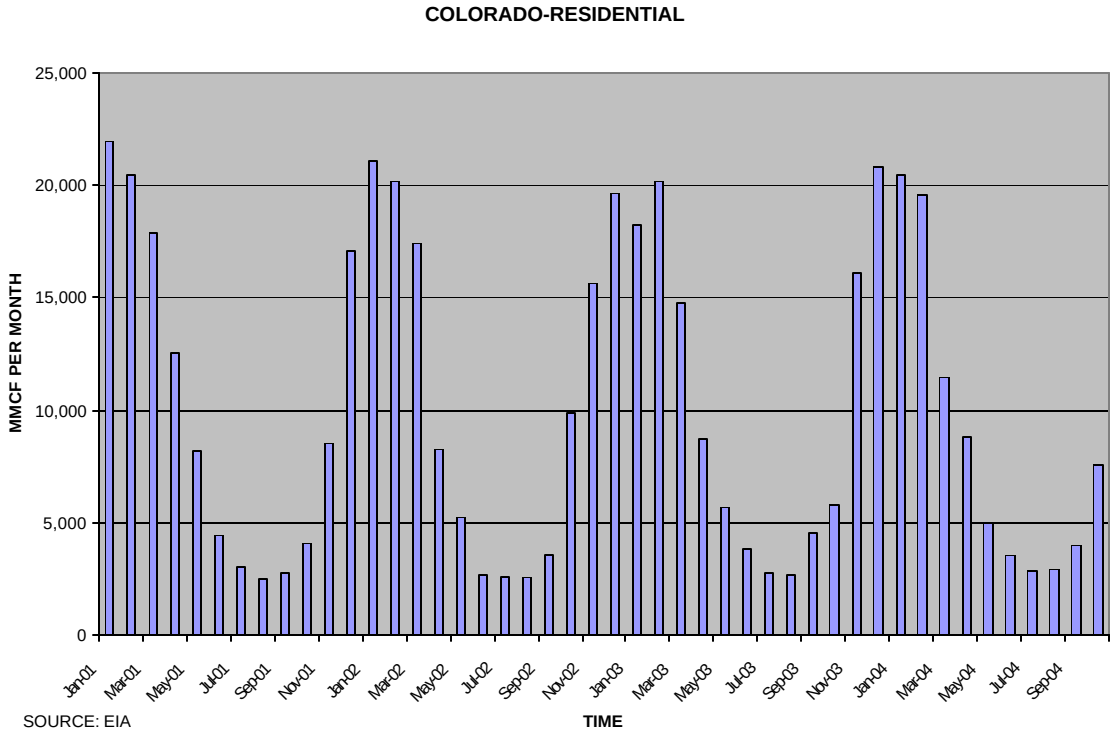
In 2002, Colorado consumed 404 billion cubic feet of natural gas. Two thirds of this consumption took place in the residential and industrial sectors at 31.9 percent and 32.2 percent respectively. Commercial end users accounted for 16.6 percent and the electric generators for 19.3 percent of the total consumption for the year.

Patterns of consumption were similar in the residential and commercial sectors with peaks occurring in the winter months and troughs in the summer months. Electric generation, also demonstrated patterns of consumption but completely different from the residential and the commercial sectors. Its peaks occurred in the summer-months and the troughs in the winter months. The industrial sector had no clear seasonal pattern of consumption, but the chart shows a declining consumption pattern over the last four years.

From 1991 to 2002, the residential sector experienced growth at the rate of approximately 2.6 percent per year and the commercial sector's consumption during this period declined at the rate of almost 0.3 percent per year. Historical data was not available for the two remaining sector to calculate reasonable growth/decline rates.



SOURCE: EIA


COLORADO-RESIDENTIAL
MMCF PER MONTH
25,000
20,000
15,000
10,000
5,000
0
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Nov-02
Jan-03
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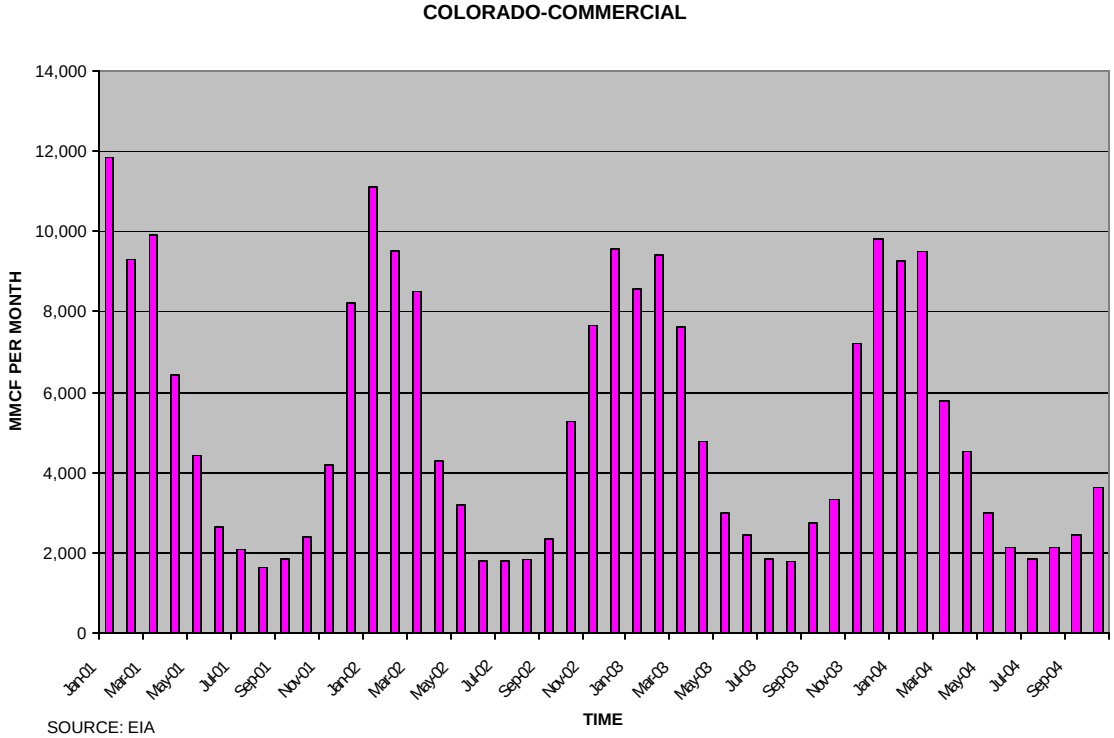
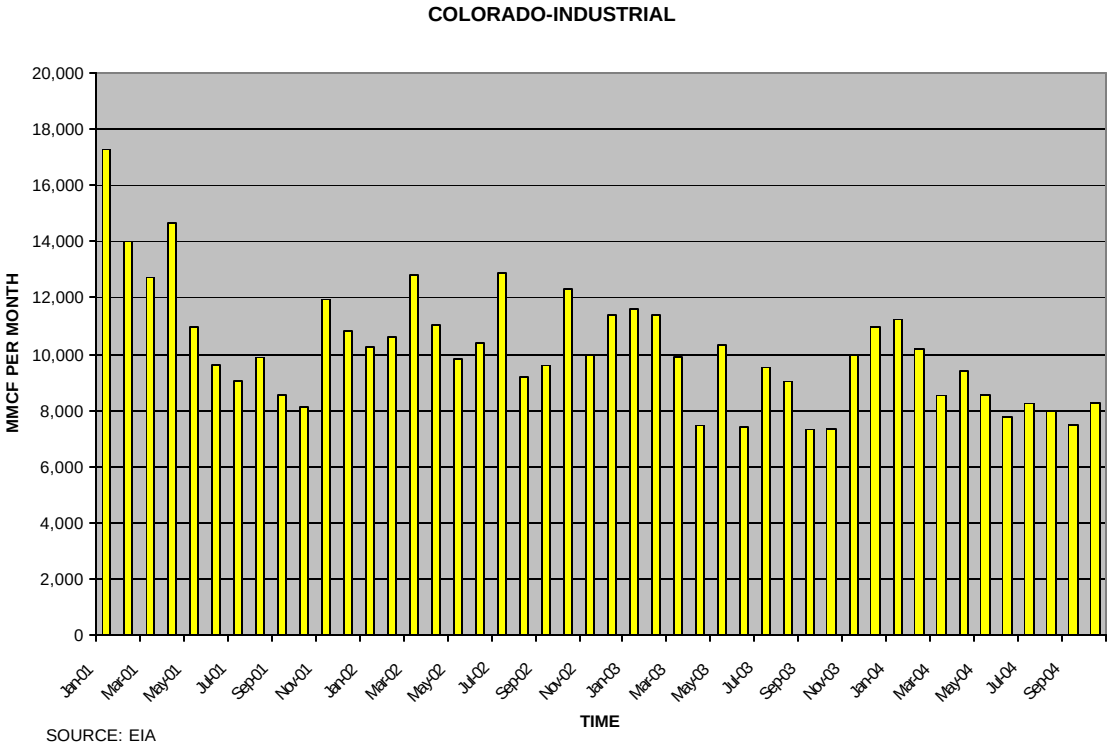
Mar-04
May-04
Jul-04
Sep-04
TIME
SOURCE: EIA


COLORADO-COMMERCIAL
MMCF PER MONTH
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Nov-02
Jan-03
Mar-03
May-03
Jul-03
Sep-03
Nov-03
Jan-04
Mar-04
May-04
Jul-04
Sep-04
TIME
SOURCE: EIA



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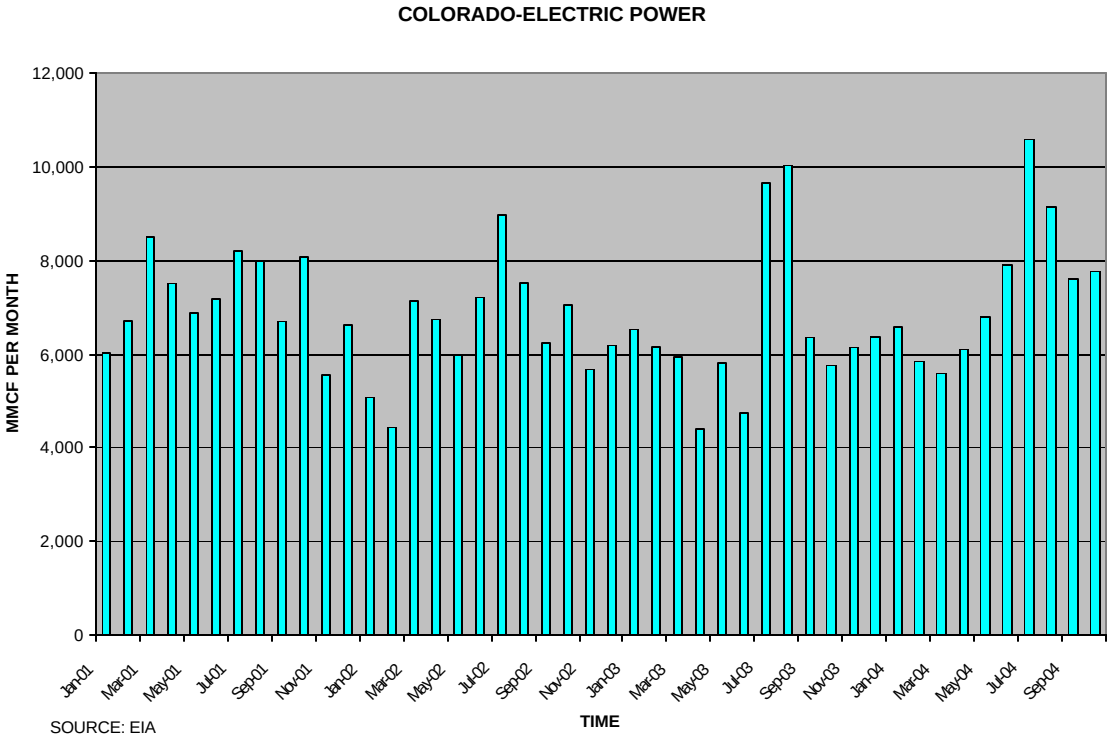


SOURCE: EIA

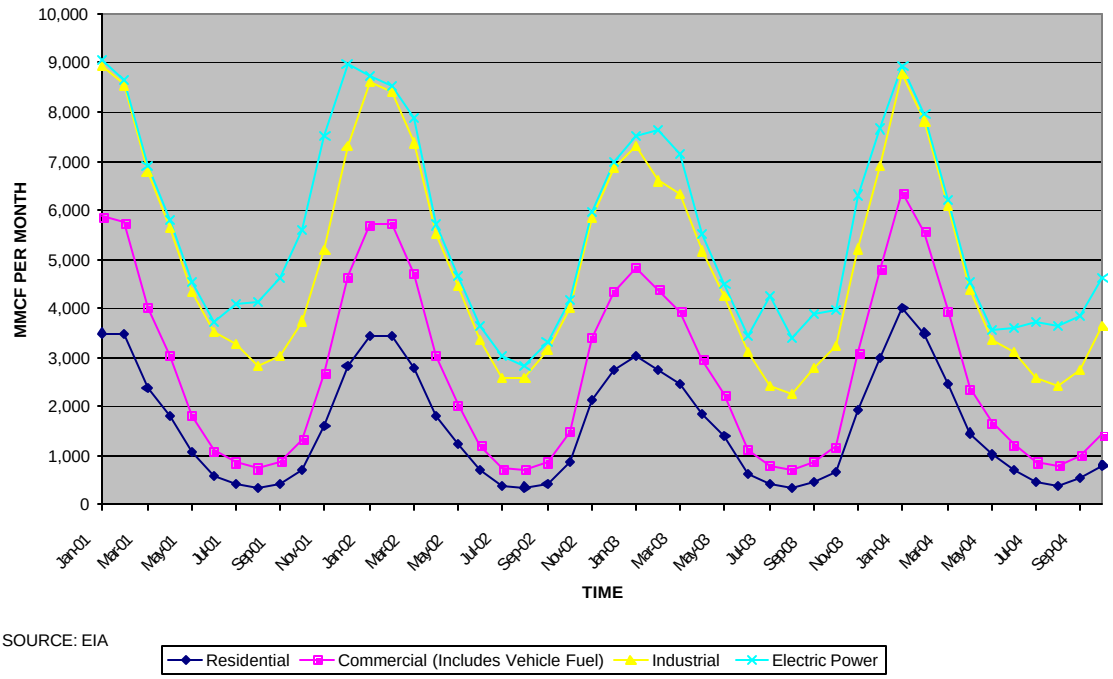
Idaho – Consumption by End Use

In 2002, Idaho consumed in total, 65 billion cubic feet of natural gas. Three quarters of this consumption was in the residential and industrial sectors, with 31.2 percent and 43.9 percent. The commercial sector consumed 20.8 percent of the 2002 total. Electric generators accounted for a smaller fraction at 4.2 percent, respectively. The patterns of consumption were somewhat similar to the other states described before.

The residential, commercial, and industrial sectors all showed peak consumption during winter months and troughs during summer months. The electric generation sector peak consumption occurred during the summer months with troughs during the winter months.

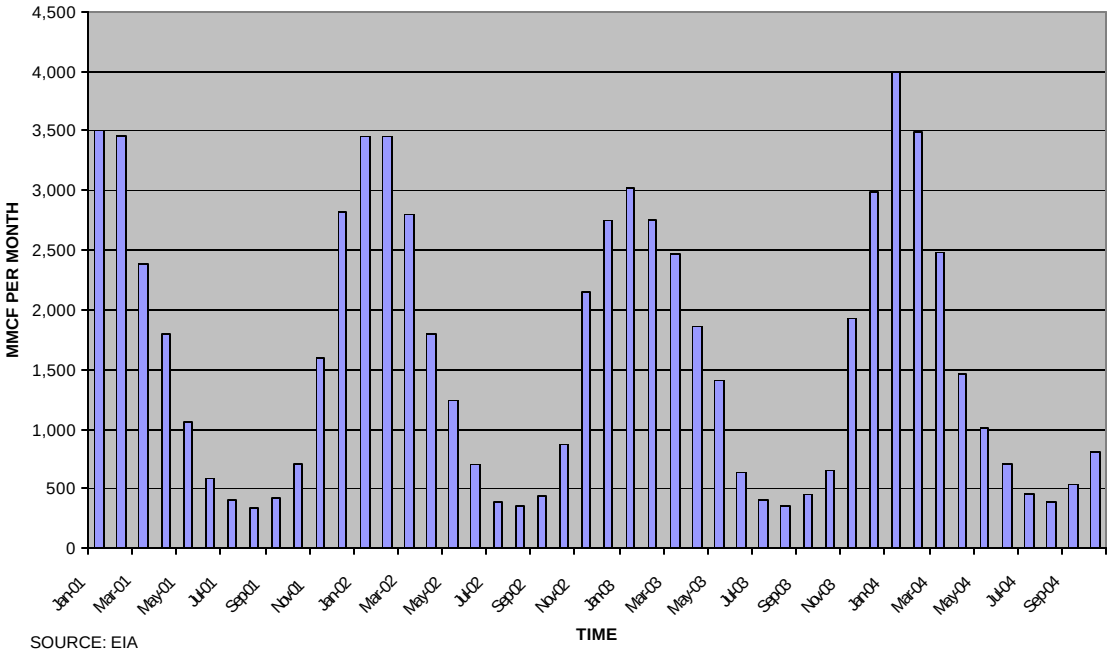
The highest growth rate, of the four sectors, took place during the period of 1991 to 2002 in the residential sector. It grew at the rate of 6.5 percent per year. The commercial sector on the other hand grew at almost half that rate. Its growth rates came in at approximately 3.2 percent per year. Data was not available for the industrial and the electric generation sectors to calculate the growth rates.

IDAHO NATURAL GAS CONSUMPTION BY END USERS



SOURCE: EIA

IDAHO-RESIDENTIAL



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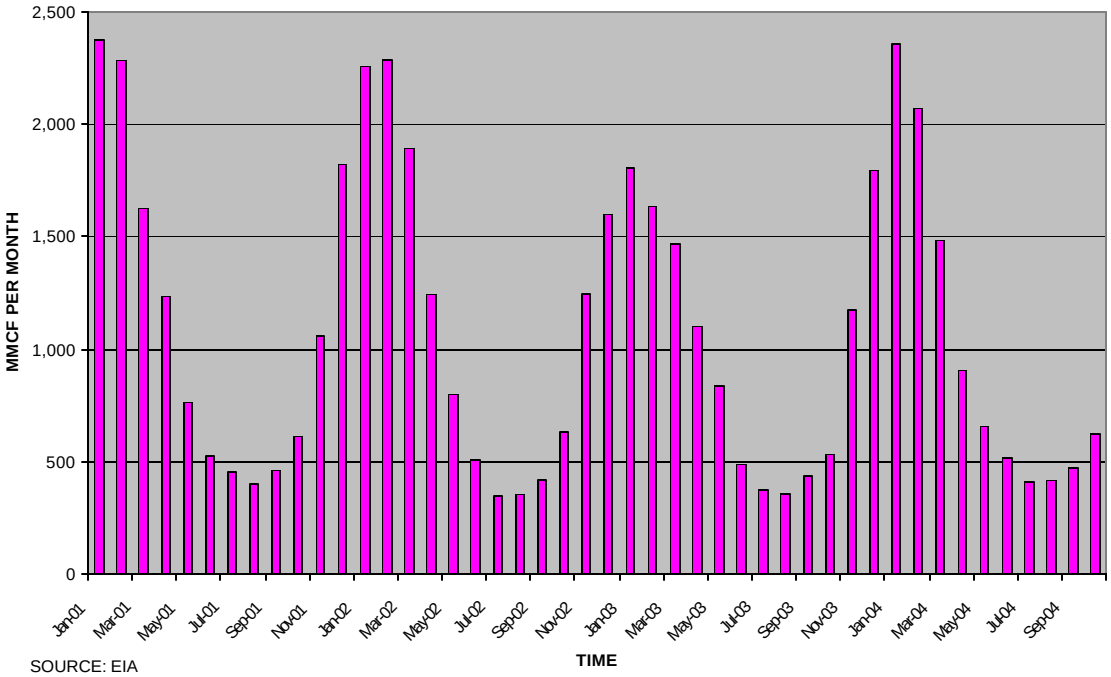
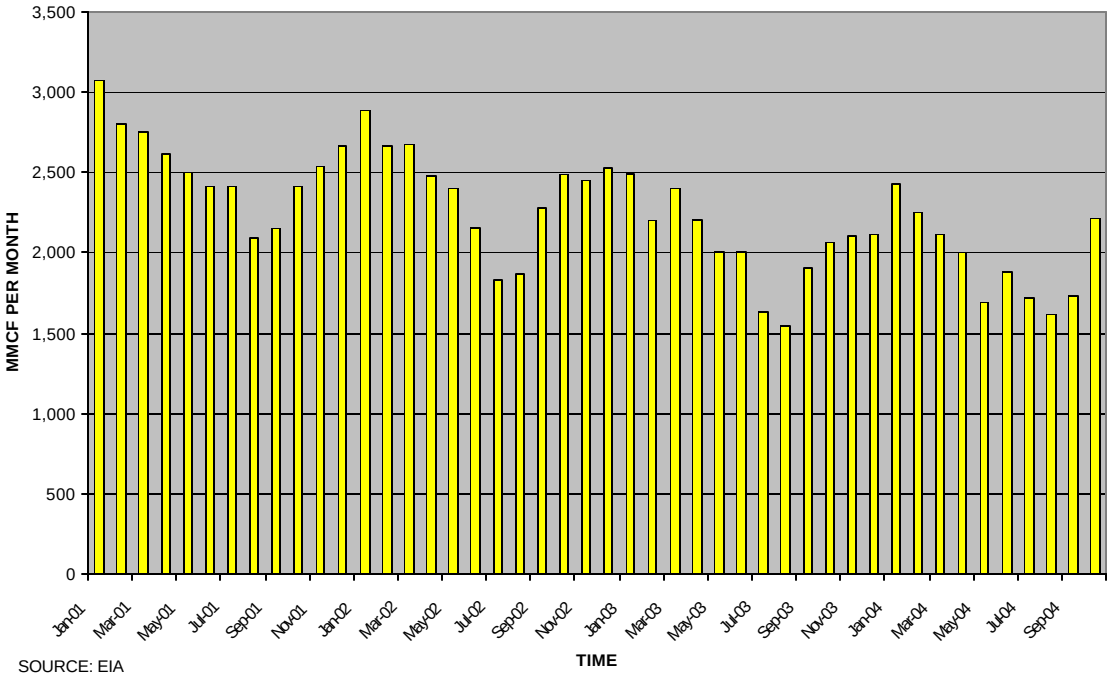


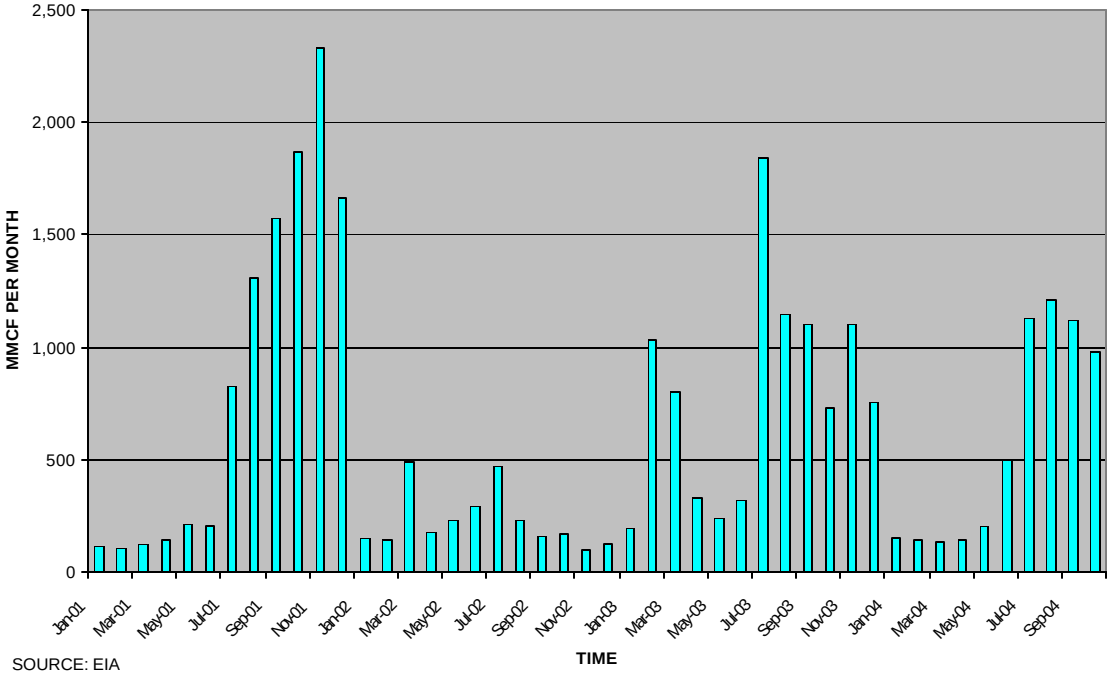
SOURCE: EIA

IDAHO-INDUSTRIAL



SOURCE: EIA

IDAHO-ELECTRIC POWER



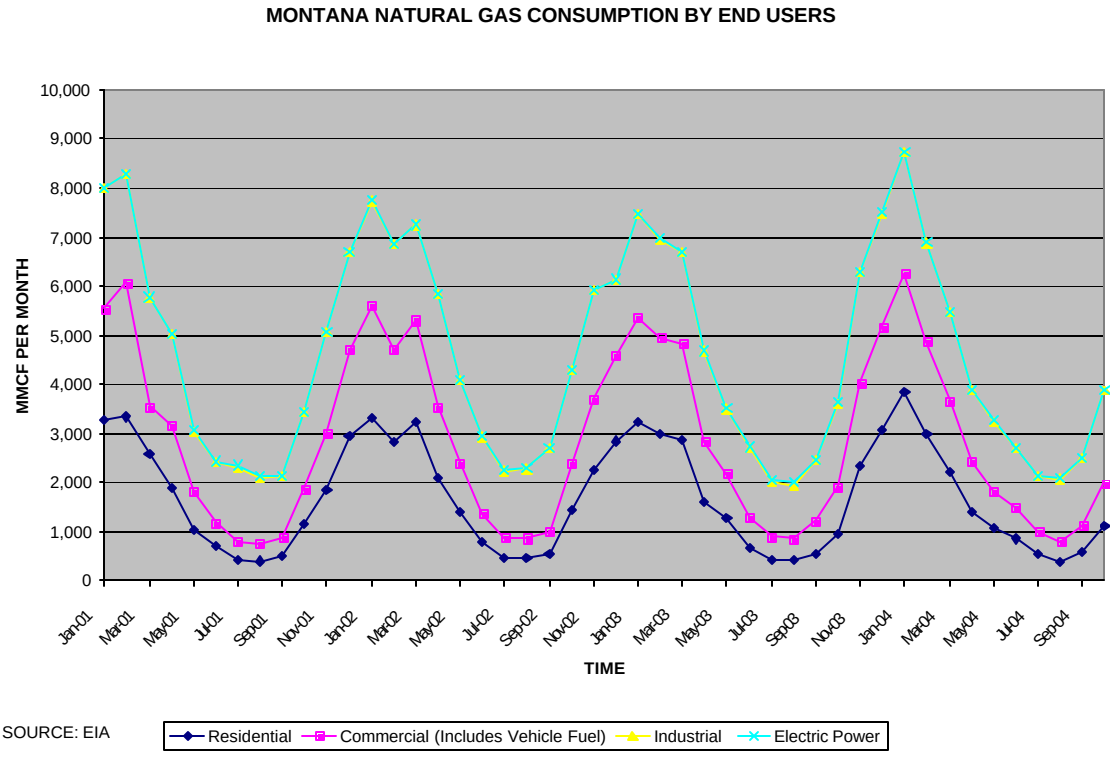
SOURCE: EIA

Montana – Consumption by End Use

In 2002, Montana used 58 billion cubic feet of natural gas. Approximately 75 percent of this use took place in the residential and the industrial sectors. Consumption in these sectors were 37.2 percent for Residential, and 37.4 percent for industrial. The commercial sector accounted for 25.2 percent of the 2002 total and the electric generation for a mere 0.2 percent. Seasonal patterns of consumption existed in the residential, commercial, and industrial sectors.

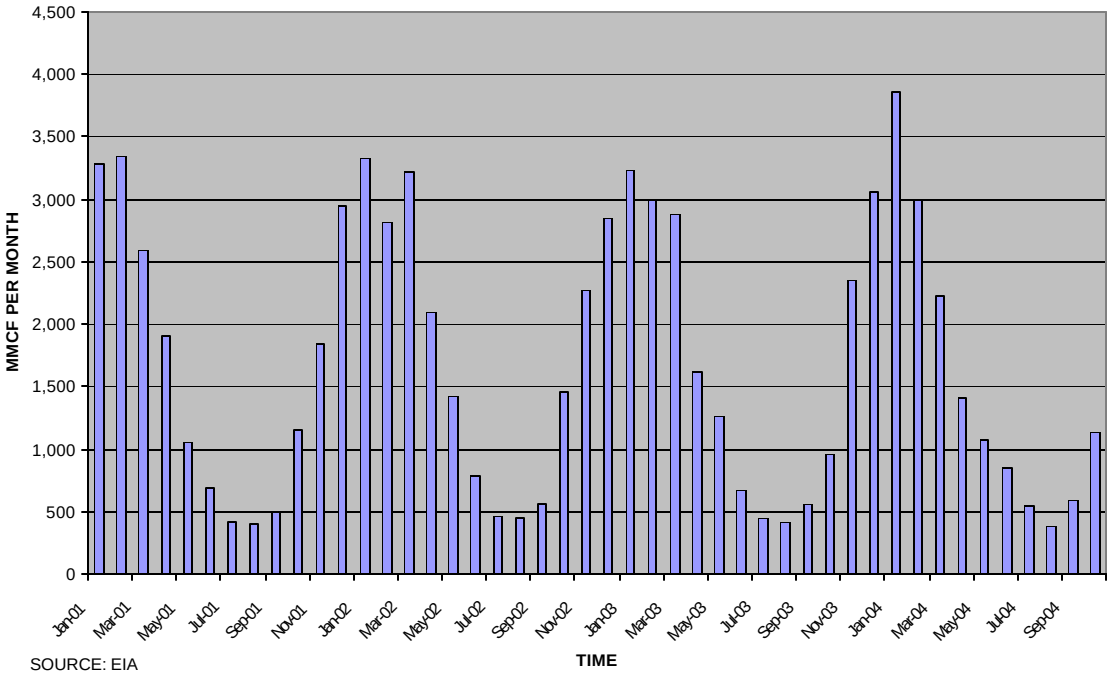
Peak consumption occurred during winter months and troughs during summer months though with differing magnitudes. The electric generation's peak occurred in the summer months and the troughs in the winter months. Growth rates were quite similar.

Residential end user consumption grew at the rate of 1.5 percent per year and the commercial end users consumption grew at the rate of 1.2 percent per year. Historical data was not available to calculate the growth rates for the remaining two sectors.



SOURCE: EIA

MONTANA-RESIDENTIAL



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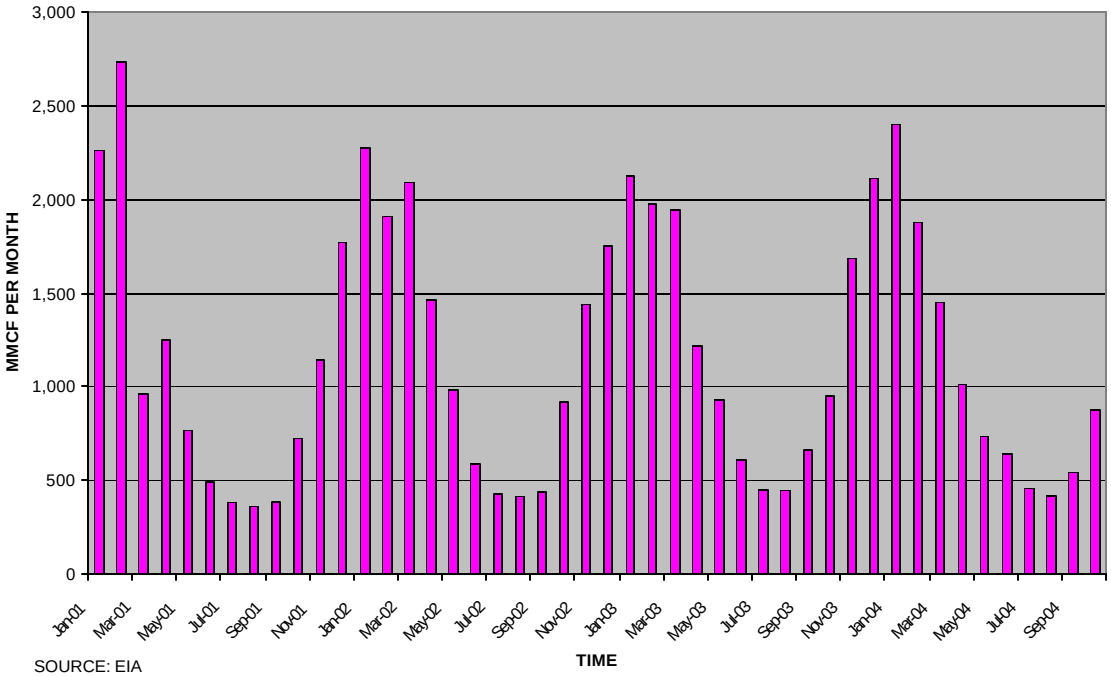
MONTANA-COMMERCIAL



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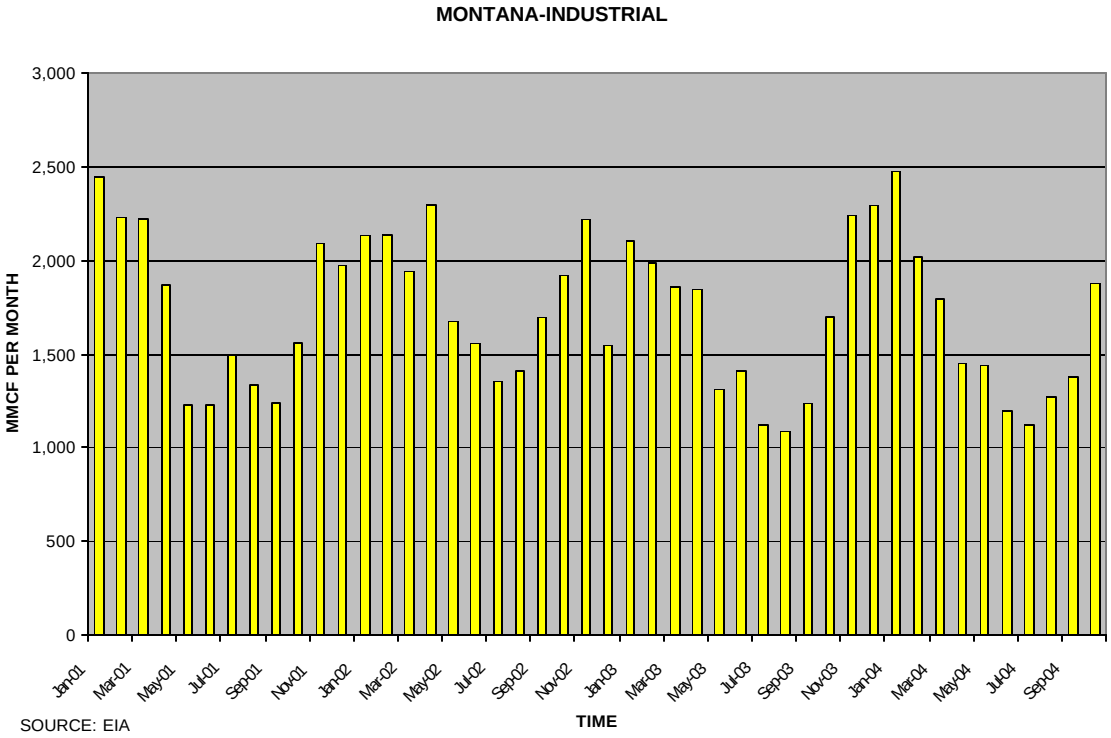

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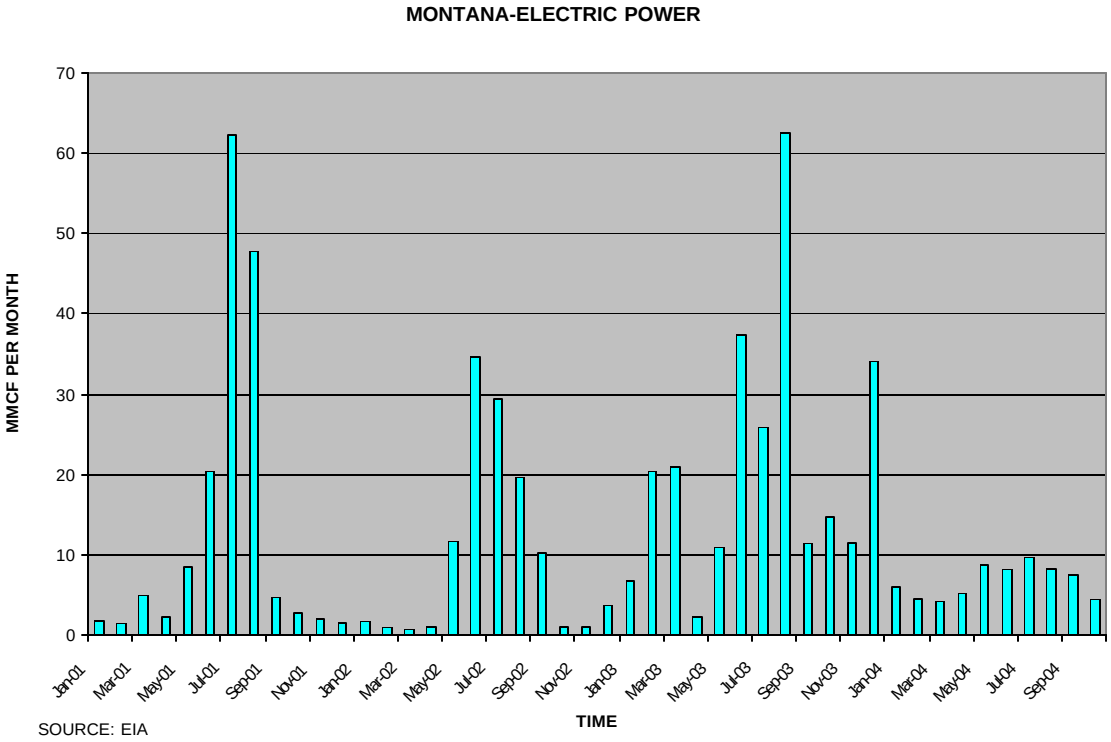


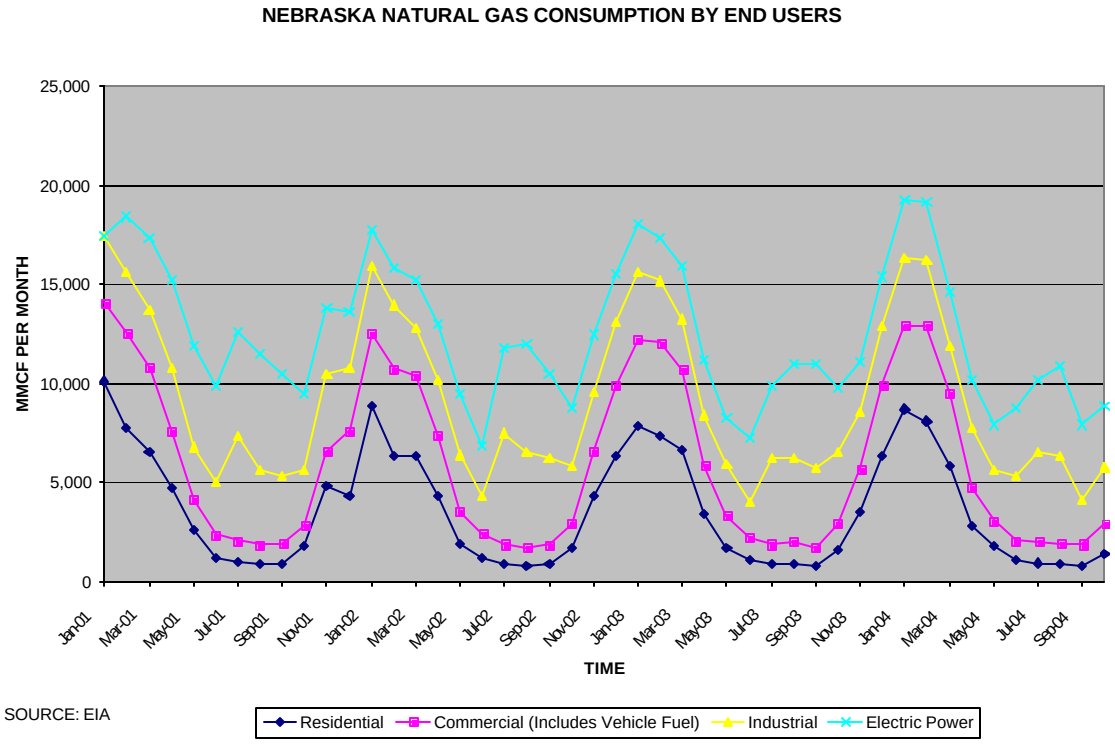
SOURCE: EIA

Nebraska – Consumption by End Use

In 2002, Nebraska consumed a total of 117 billion cubic feet of natural gas. Of this consumption, the residential and the industrial sectors jointly consumed 71.8 percent. The residential sector accounted for 37.3 percent of the consumption. The industrial sector consumed the remaining 34.4 percent. The Commercial sector consumed 24.0 percent of the demand in 2002 and the electric generation accounted for only 4.2 percent.

Consumption patterns for the four sectors differed slightly. The residential and the commercial sectors experienced peaks in their consumption during winter months and troughs during summer months. Unlike the other states, consumption in Nebraska's Industrial sector followed the pattern of its electric generation sector. Both of these sectors peaked during the summer months and decreased during the winter months.

From 1991 to 2002, the residential and the commercial sectors both experienced a decrease in consumption. The residential sector consumption declined at an annual rate of 0.2 percent per year and the commercial sector saw its consumption decline at 3.2 percent per year. Due to insufficient historical data for the industrial and the electric generation sectors, rates of growth/declines in consumption were not calculated.



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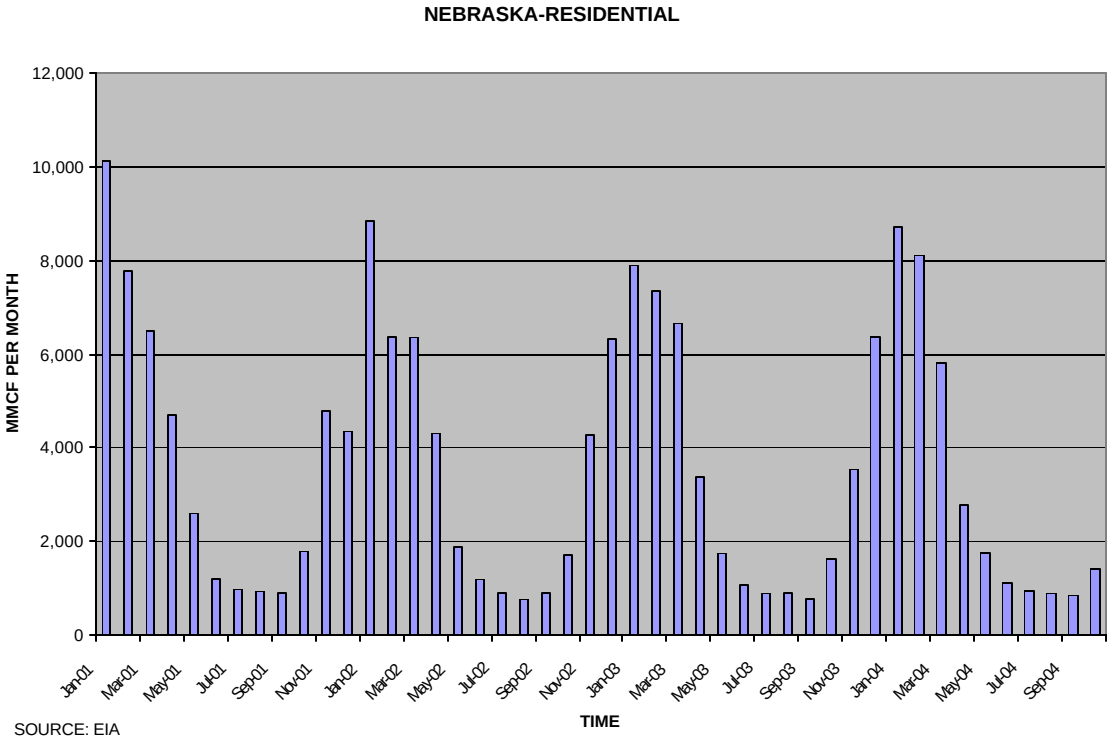

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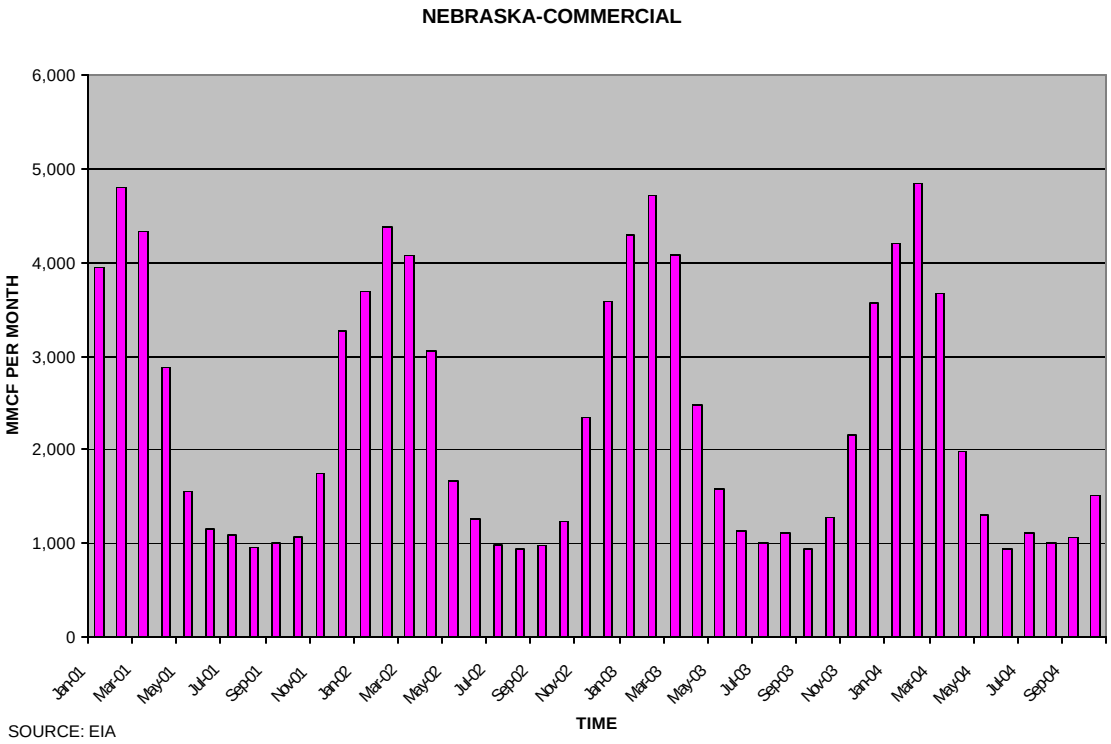
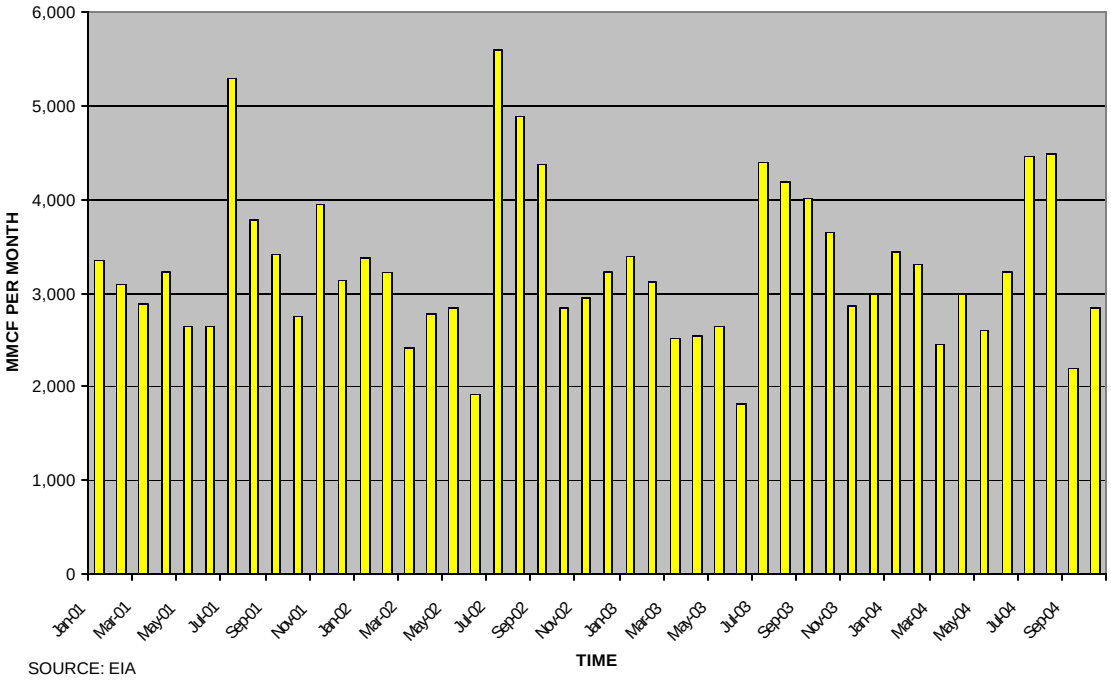


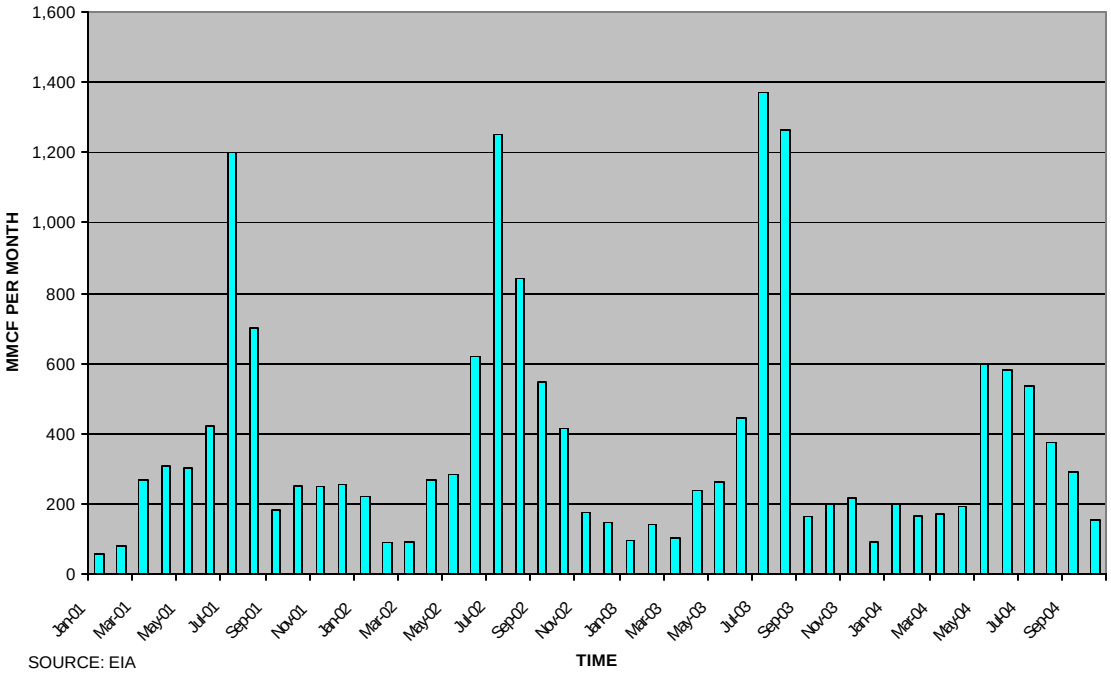
SOURCE: EIA

NEBRASKA-INDUSTRIAL



SOURCE: EIA

NEBRASKA-ELECTRIC POWER



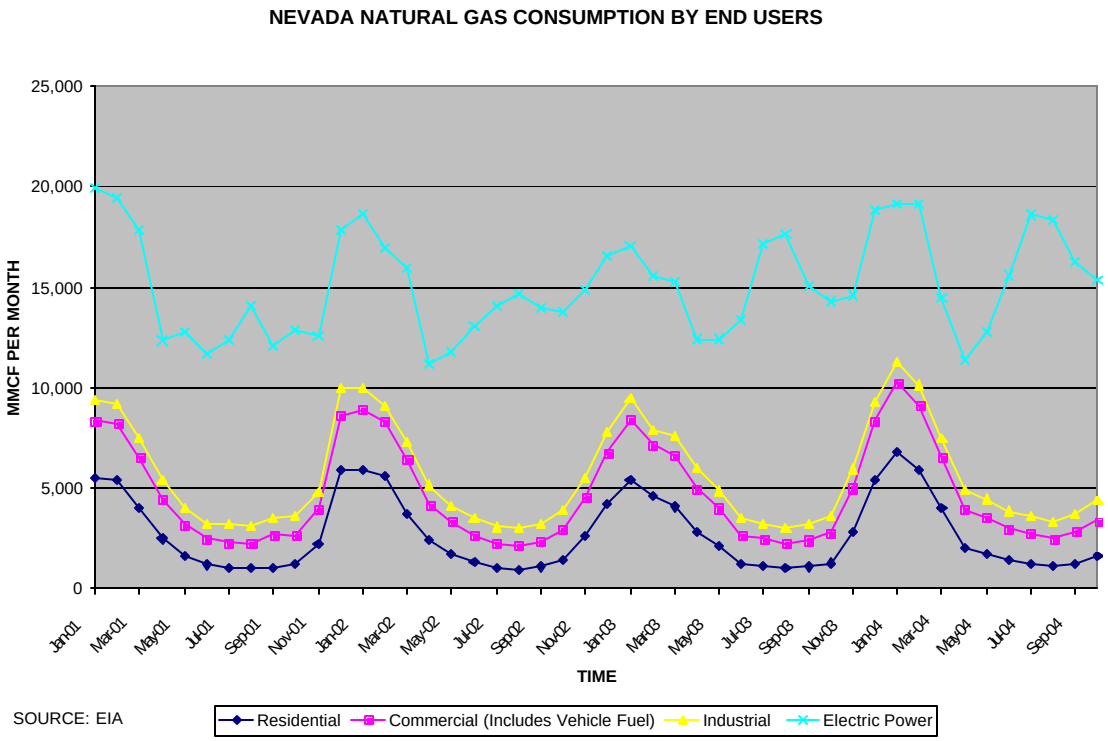
SOURCE: EIA

Nevada – Consumption by End Use

In 2002, Nevada consumed a total of 175 billion cubic feet of natural gas. Most of the natural gas consumed was for the production of electricity. The electric sector accounted for 62.5 percent of the total consumed. The residential, commercial, and industrial user's shares were 18.2 percent, 12.9 percent, and 6.3 percent, respectively.

The residential, commercial, and industrial sectors, all showed peak consumption during winter months and lowest demand levels of this commodity during the summer months. The electric generation end use had a strong pattern of consumption with peaks occurring in the summers and troughs in the winters. Growth rates in Nevada were very strong.

Strong patterns of consumption were noticeable in the residential and commercial sectors. From 1991 to 2002, the Residential and the Commercial end use sectors experienced growth rates approximately equal to 4.8 percent and 2.7 percent, respectively. No growth rates can be presented for the industrial and the electric generation end uses, due to lack of historical data.



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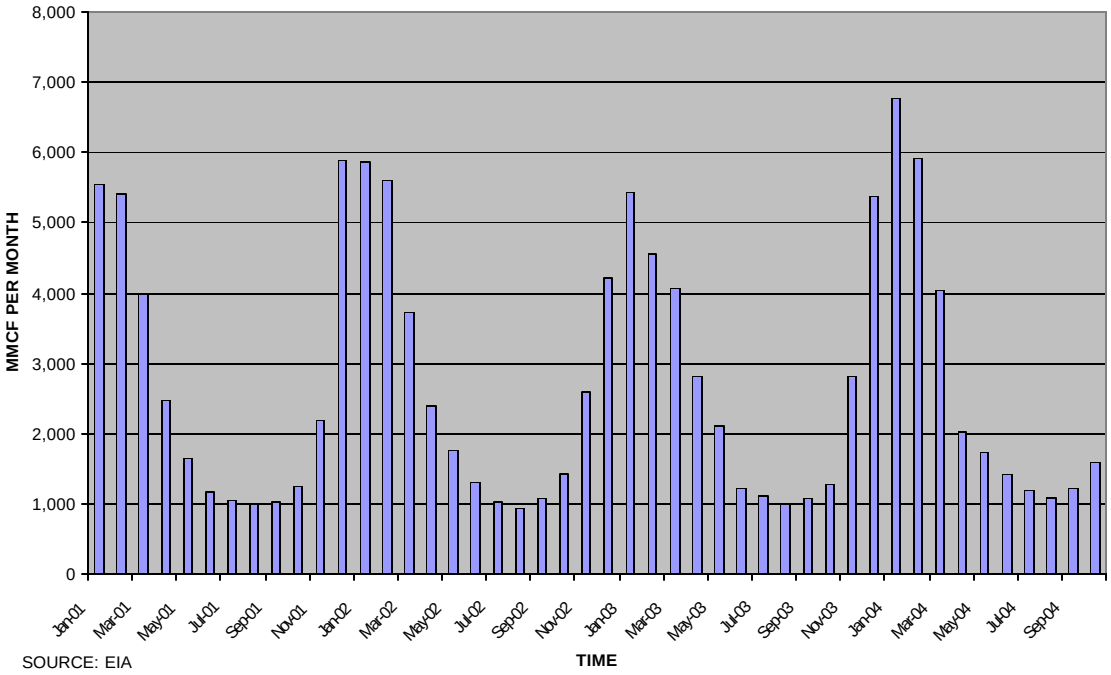
NEVADA-RESIDENTIAL



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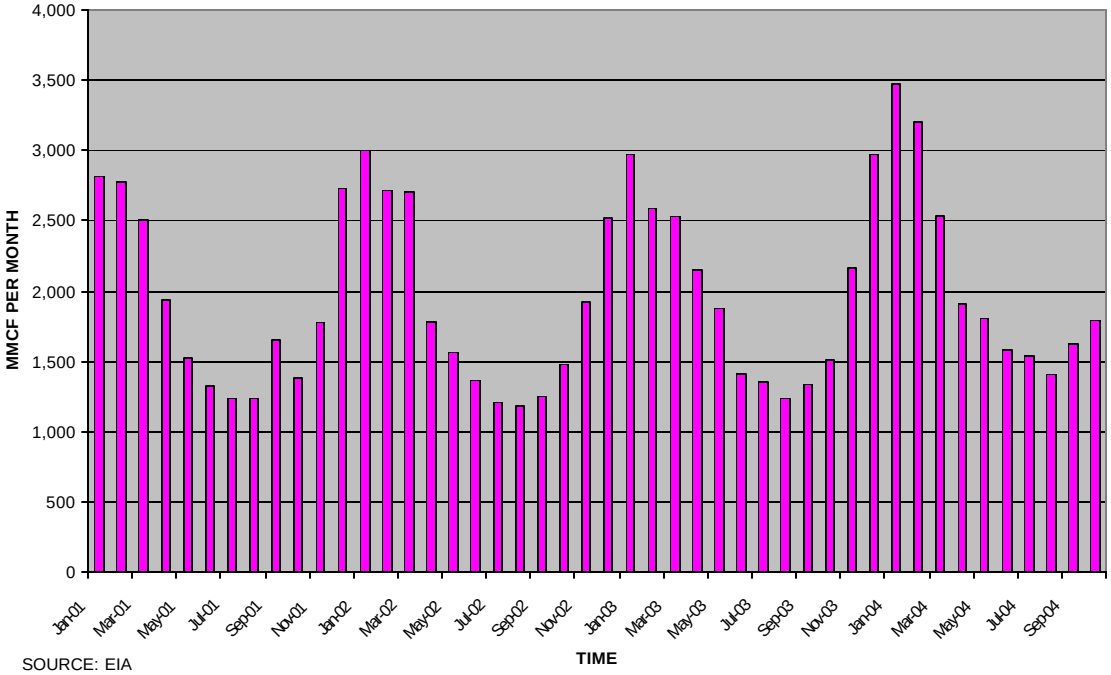
NEVADA-COMMERCIAL



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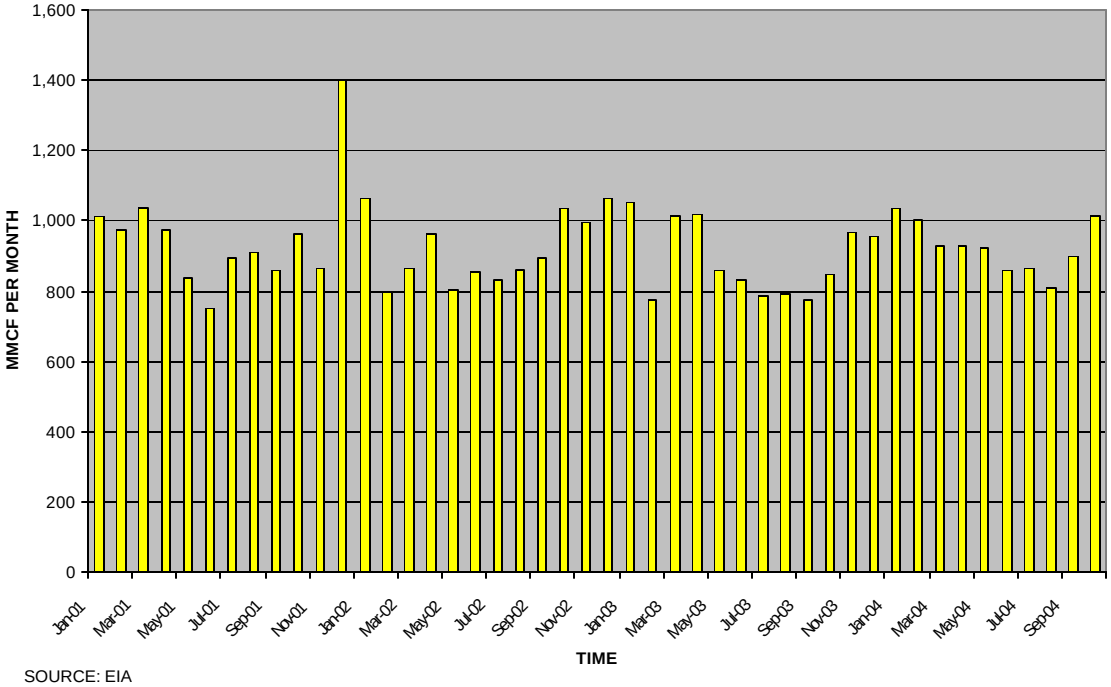

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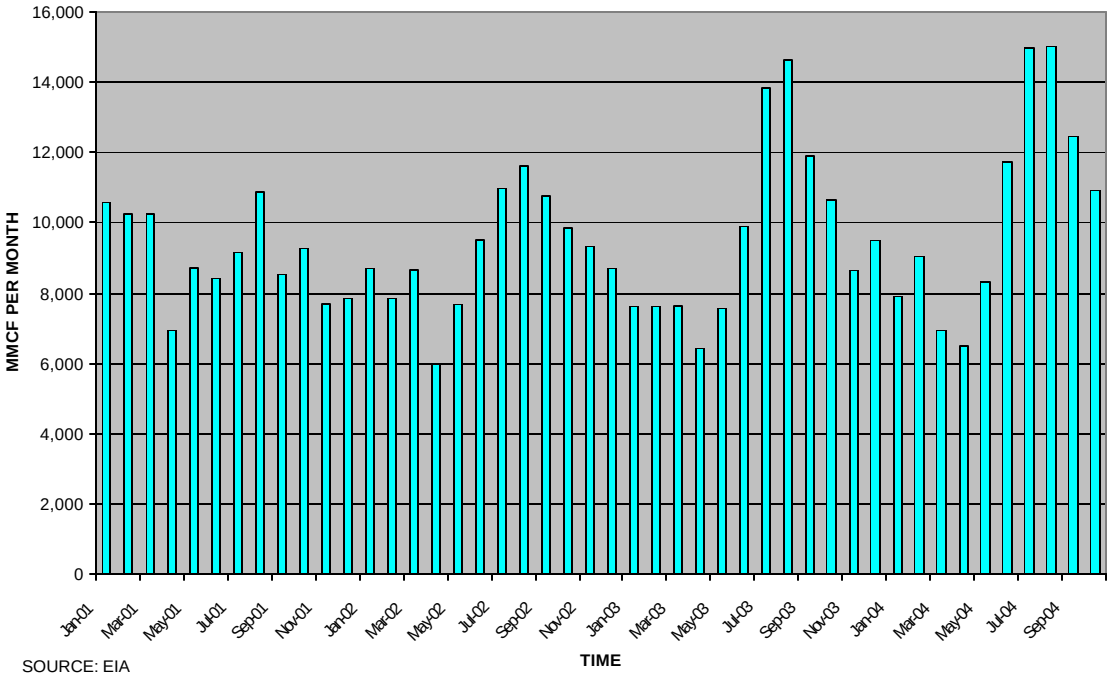
NEVADA-ELECTRIC POWER



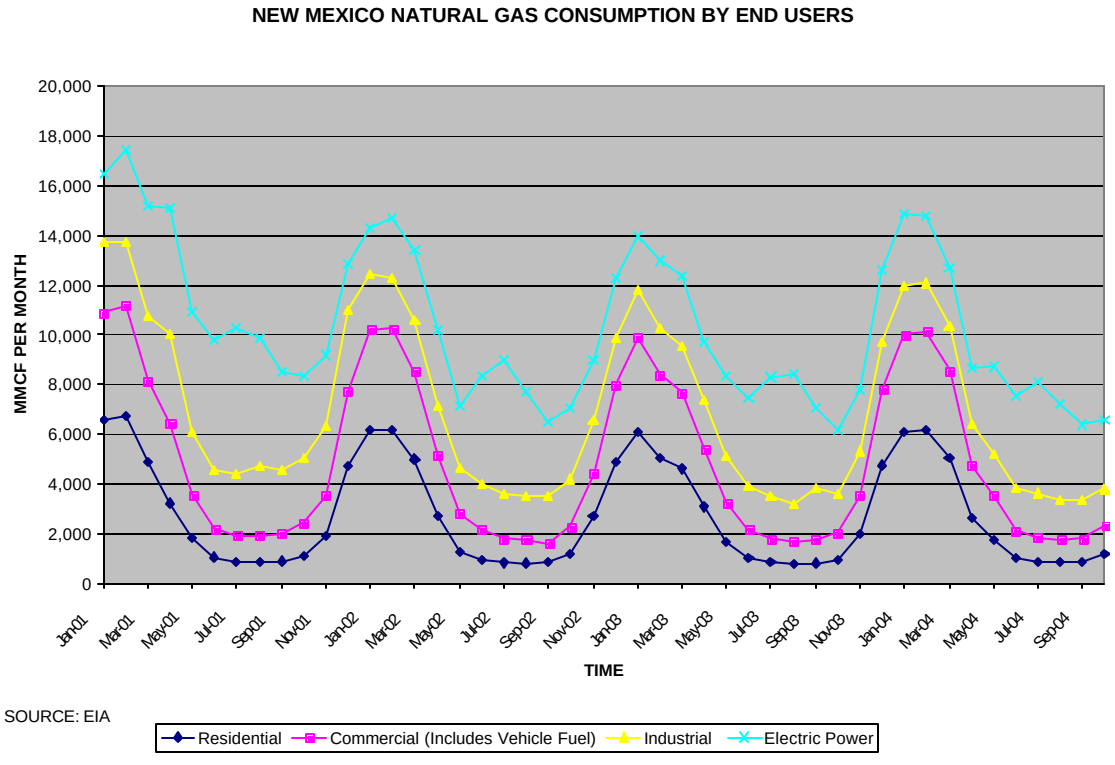
SOURCE: EIA

New Mexico – Consumption by End Use

In 2002, New Mexico consumed 120 billion cubic feet (bcf) of natural gas. Of this consumption, residential end use, accounted for 28.0 percent. Commercial and industrial end use, consumed 21.3 percent and 19.5 percent, respectively. The electric generation end use consumed the greatest of four sectors, at 31.2 percent of the 2002 total consumption. Patterns of consumption in New Mexico were similar to two other states of the WIEB region, most notably, Arizona and California.

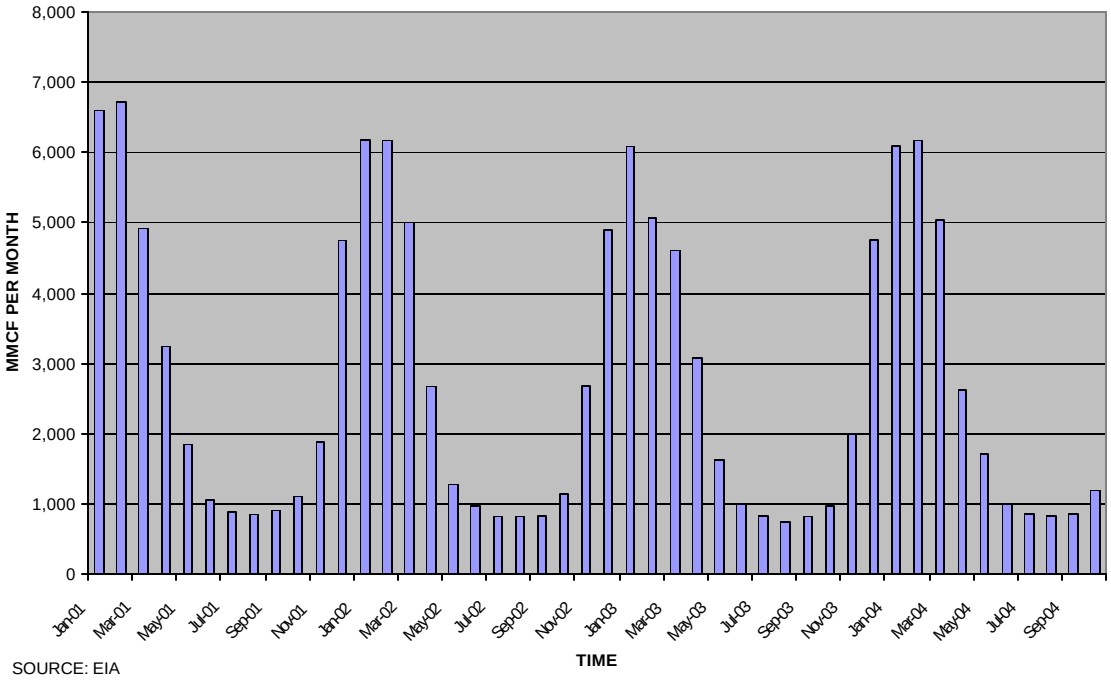
The residential and the commercial sectors for New Mexico indicated peaks in consumption during winter months and troughs during summer months. As seen in the following chart the industrial sector exhibited no clear pattern of natural gas usage. In all three of these states (Arizona, California, and New Mexico) natural gas used for electric generation reached its highest consumption levels during the summer months and the lowest levels in winter months.

Residential growth rate of consumption during the period of 1991 to 2002 came in at 1.1 percent per year. The commercial sector during this period experienced growth in consumption at an annual rate of 0.2 percent. Historical data was not available for the industrial and the electric generation sectors to calculate a growth/declines rates.



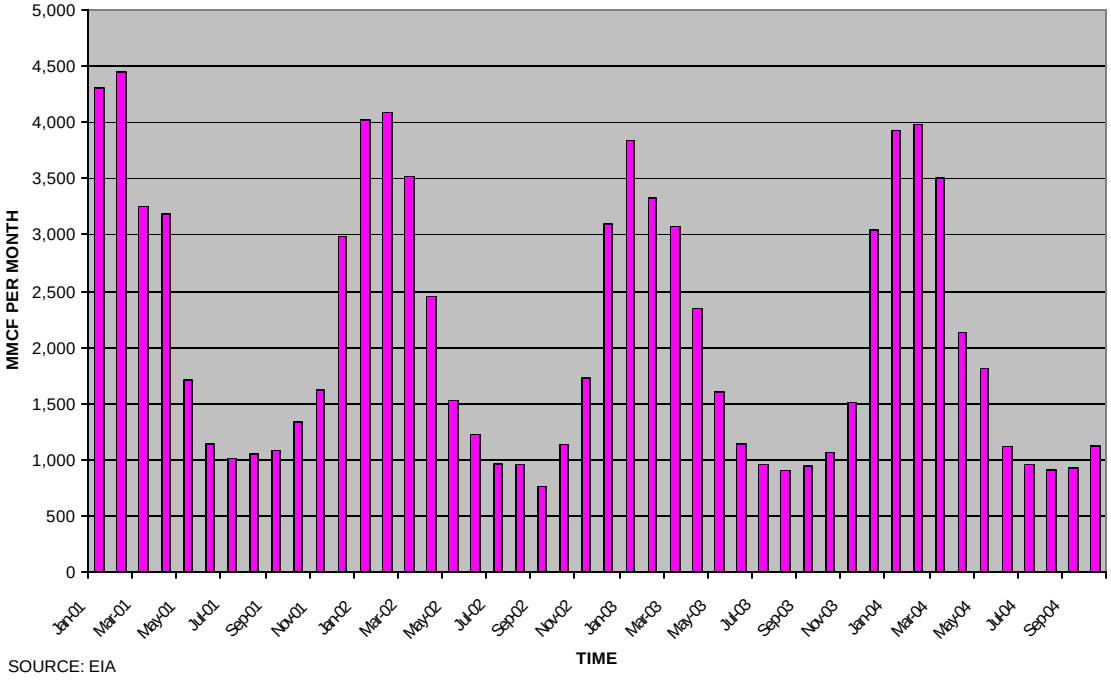
SOURCE: EIA

NEW MEXICO-RESIDENTIAL



SOURCE: EIA

NEW MEXICO-COMMERCIAL



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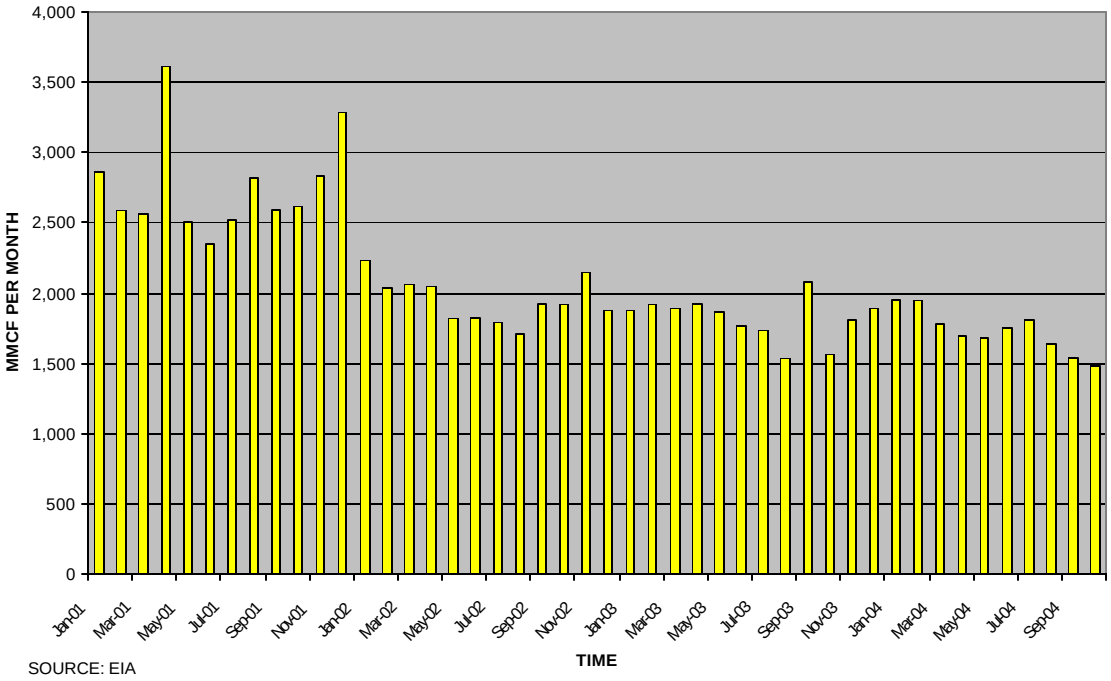
NEW MEXICO-INDUSTRIAL



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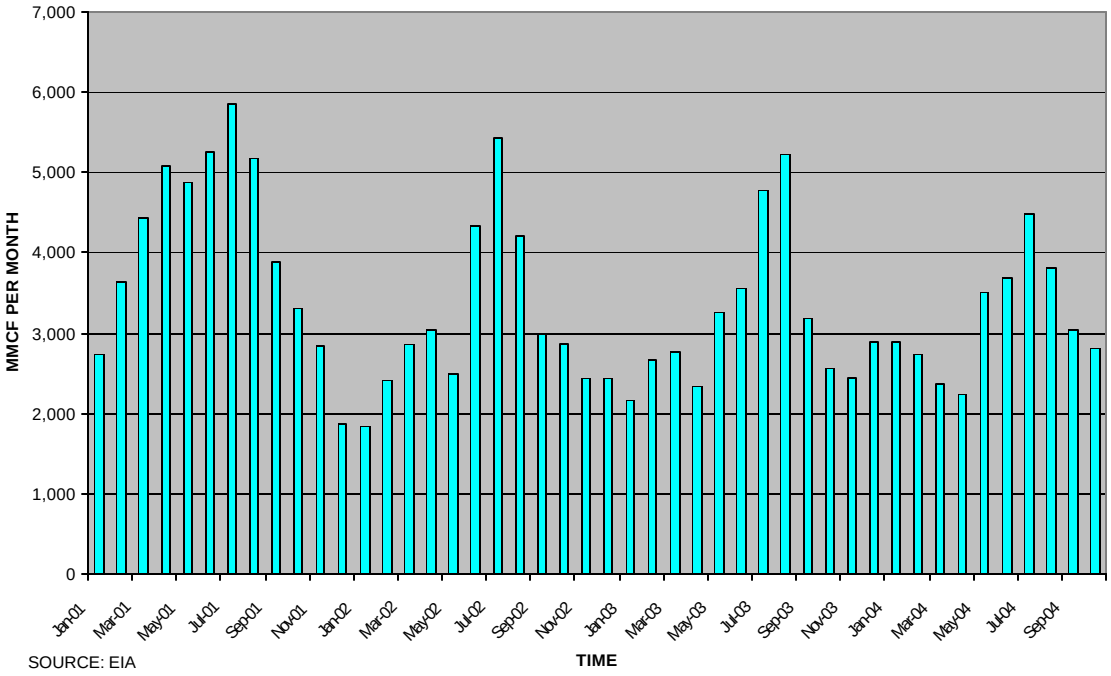
NEW MEXICO-ELECTRIC POWER



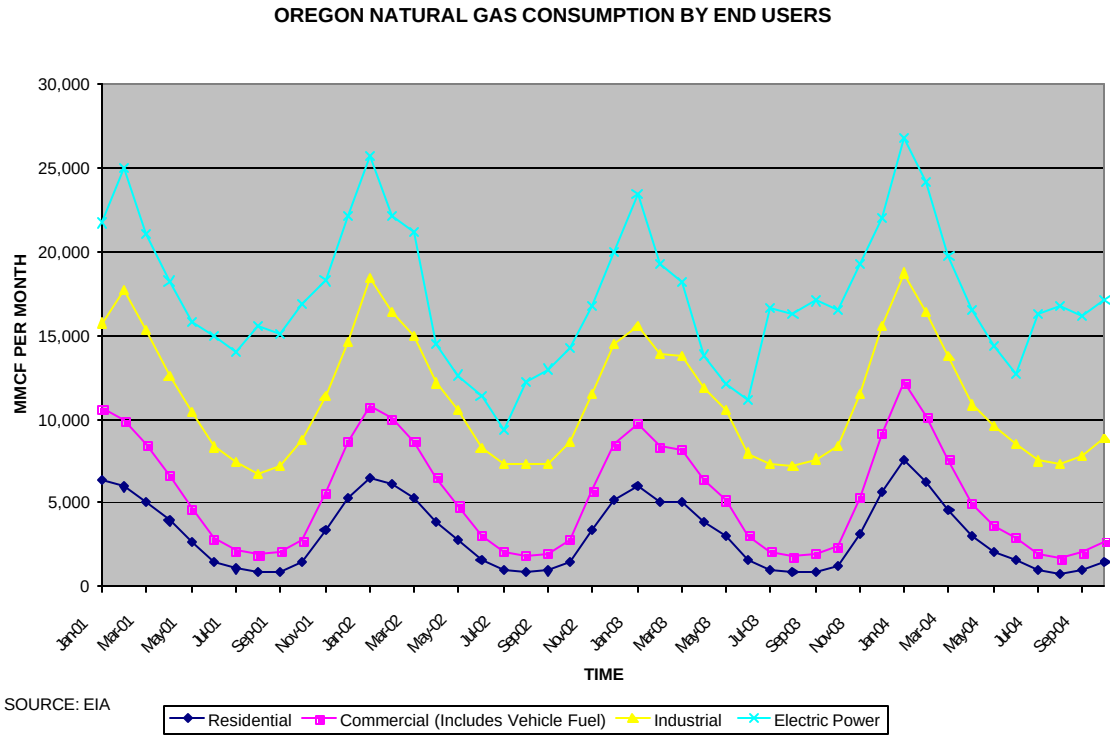
SOURCE: EIA

Oregon – Consumption by End Use

In 2002, Oregon's natural gas consumption was 193 billion cubic feet. Residential end use was 20.1 percent of the total. Use by the commercial sector was at 14.4 percent. The industrial and the electric generation sectors usage was 36.5 percent and 28.9 percent, respectively.

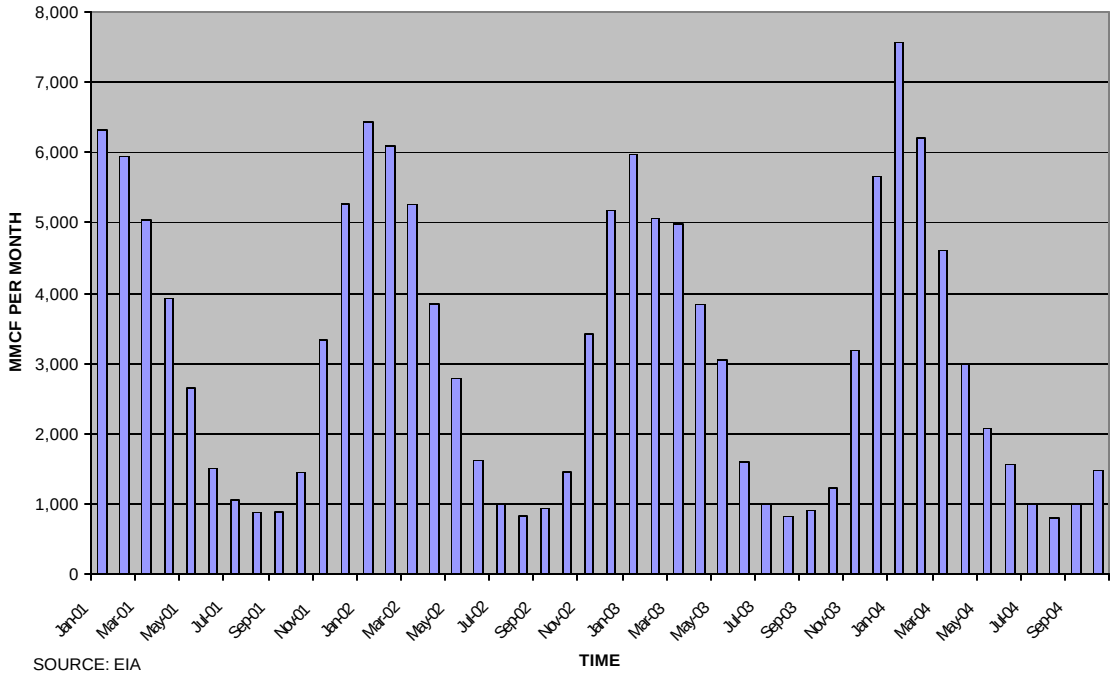
Electric generation sector exhibited no real discernable pattern of use. The industrial sector, on the other hand, showed a slight pattern in its monthly consumptions. It peaked during winter months and then declined to its lowest levels in the summer months. Unlike these two sectors, the residential and the commercial sectors had the same patterns in their monthly consumptions. Reaching peaks during winter-months and then transitioning to the lower levels of the summer-months.

Both the residential and the commercial sectors experienced growth rates of 3.6 percent and 2.0 percent, respectively. Historical data was not are available to present growth/decline rates for the industrial and the electric generation sectors.



SOURCE: EIA

OREGON-RESIDENTIAL



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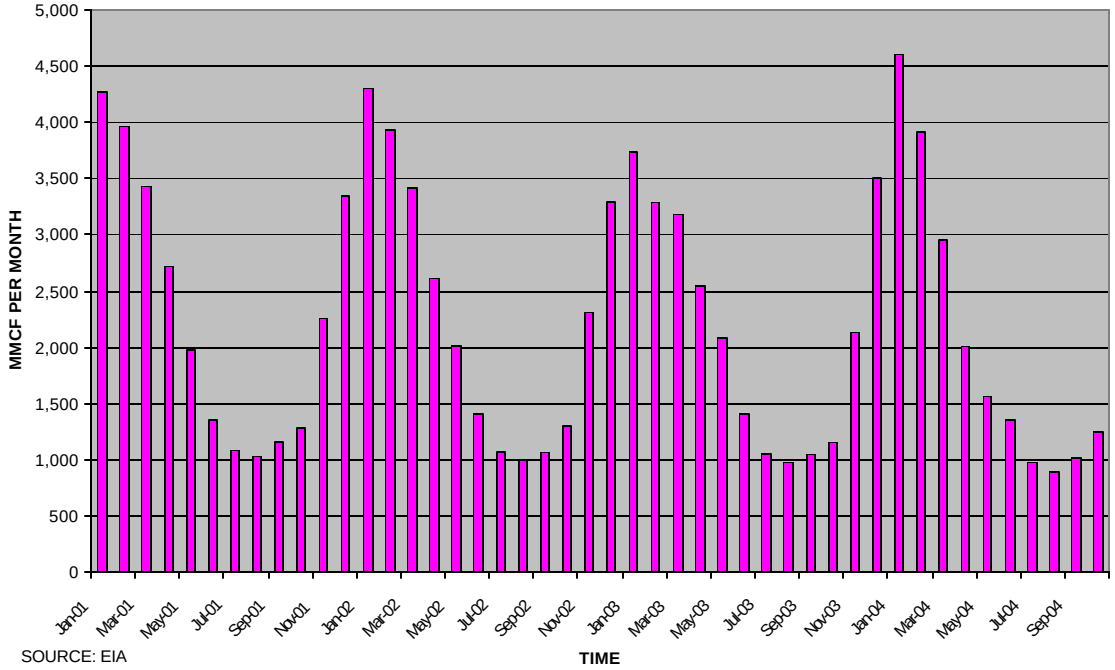
OREGON-COMMERCIAL



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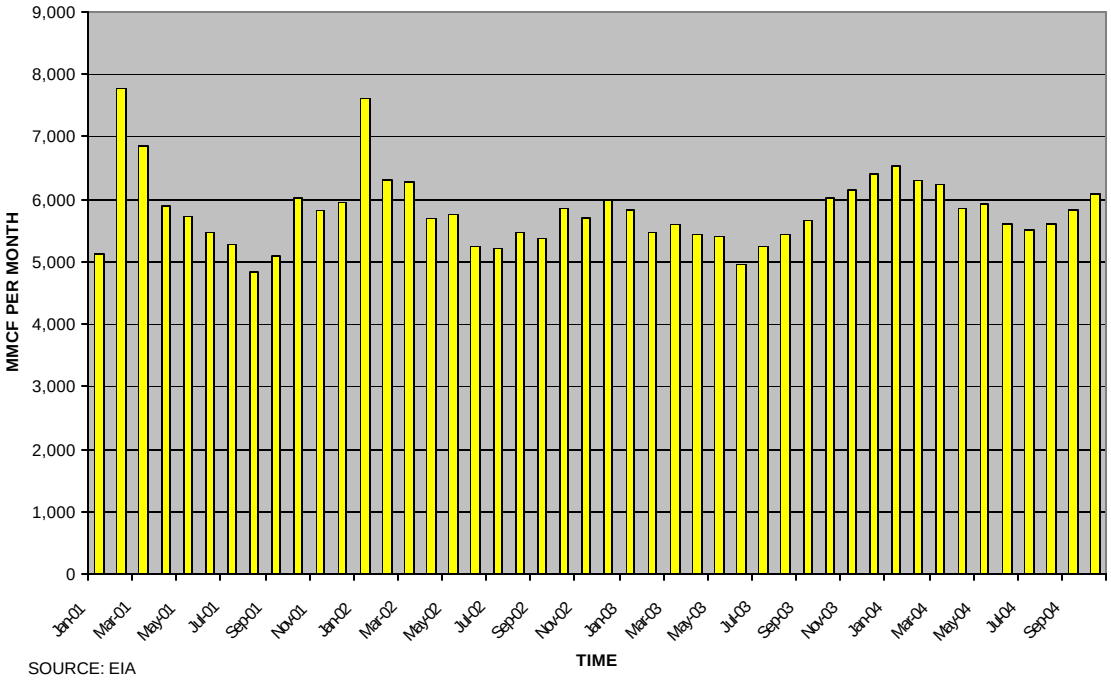
OREGON-INDUSTRIAL



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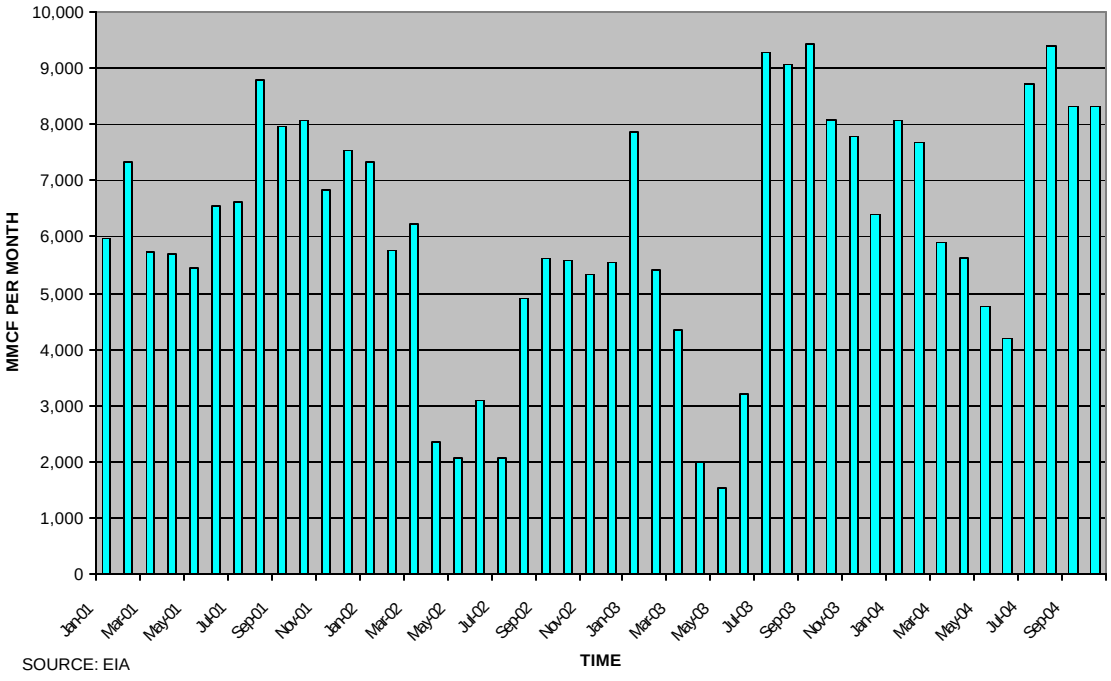
OREGON-ELECTRIC POWER



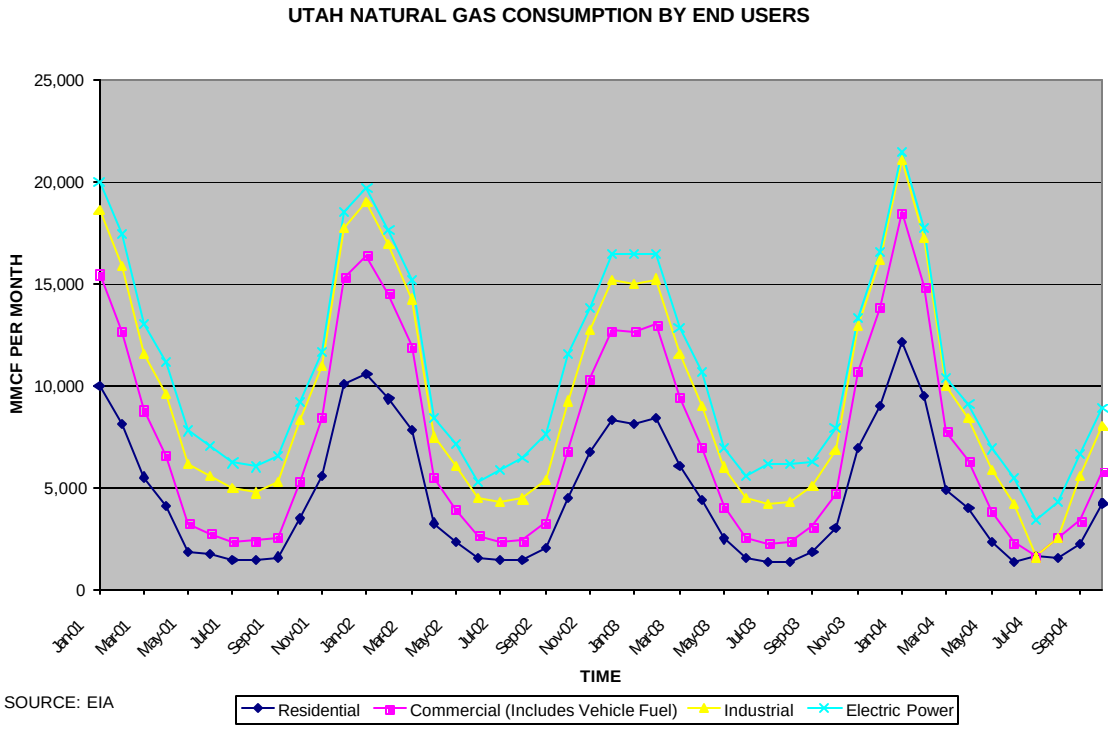
SOURCE: EIA

Utah – Consumption by End Use

In 2002, Utah consumed approximately 135 billion cubic feet of natural gas. Residential demand accounted for 43.9 percent of this total consumption. Industrial, commercial, and electric generation accounted for 24.8 percent, 19.9 percent, and 11.4 percent, respectively.

Residential and commercial sectors both showed peak consumption during winter months and lowest levels of natural gas demand during the summer months. The industrial sector peaked during the winter months and receded during summer months. Electric generation showed no visually noticeable pattern of use.

The residential and commercial sectors experienced growth rates of 1.5 percent and 5.2 percent, respectively, per year from 1991 to 2002. Sufficient historical data was not available for the industrial and the electric generators to calculate annual growth rates.



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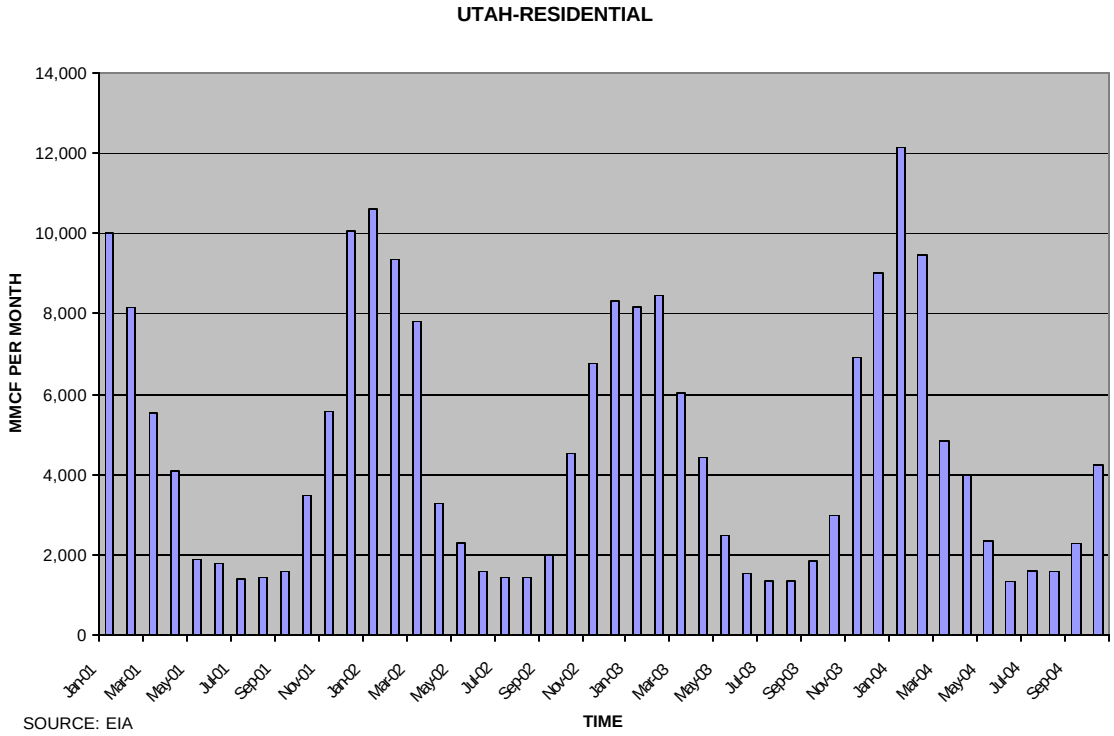

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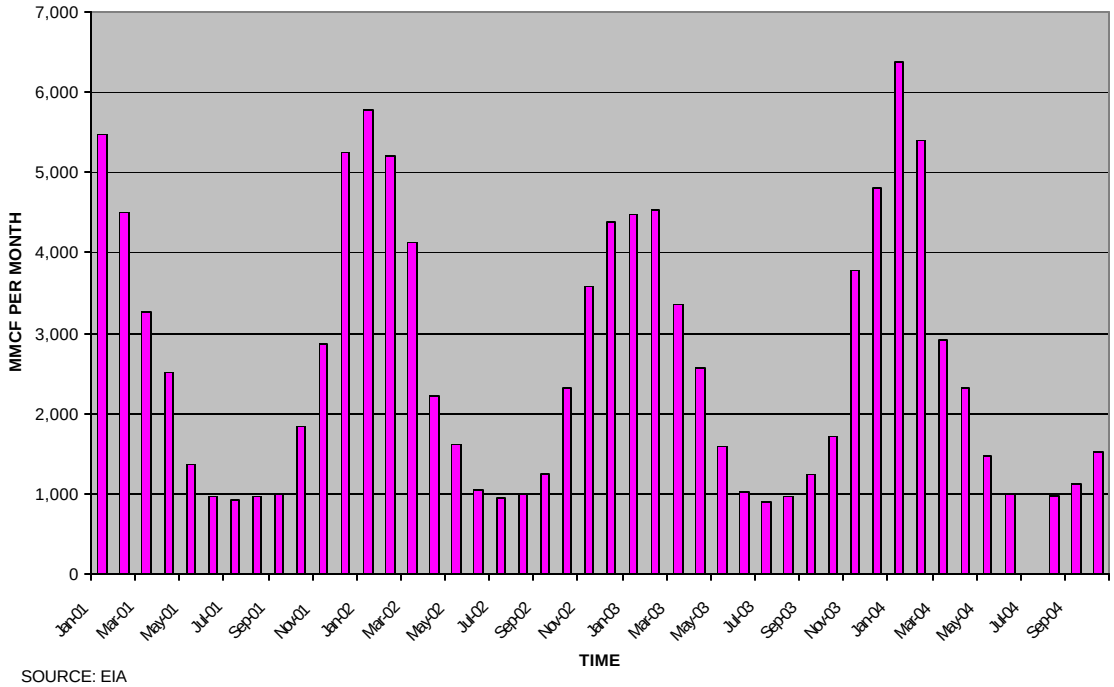

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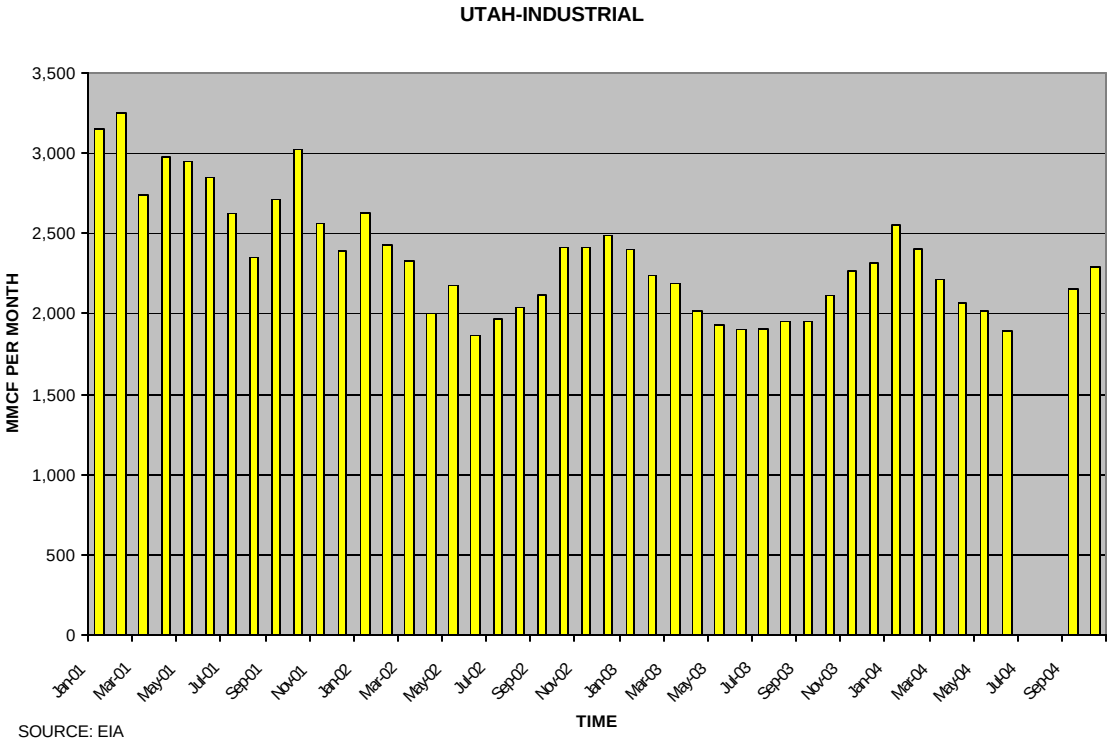

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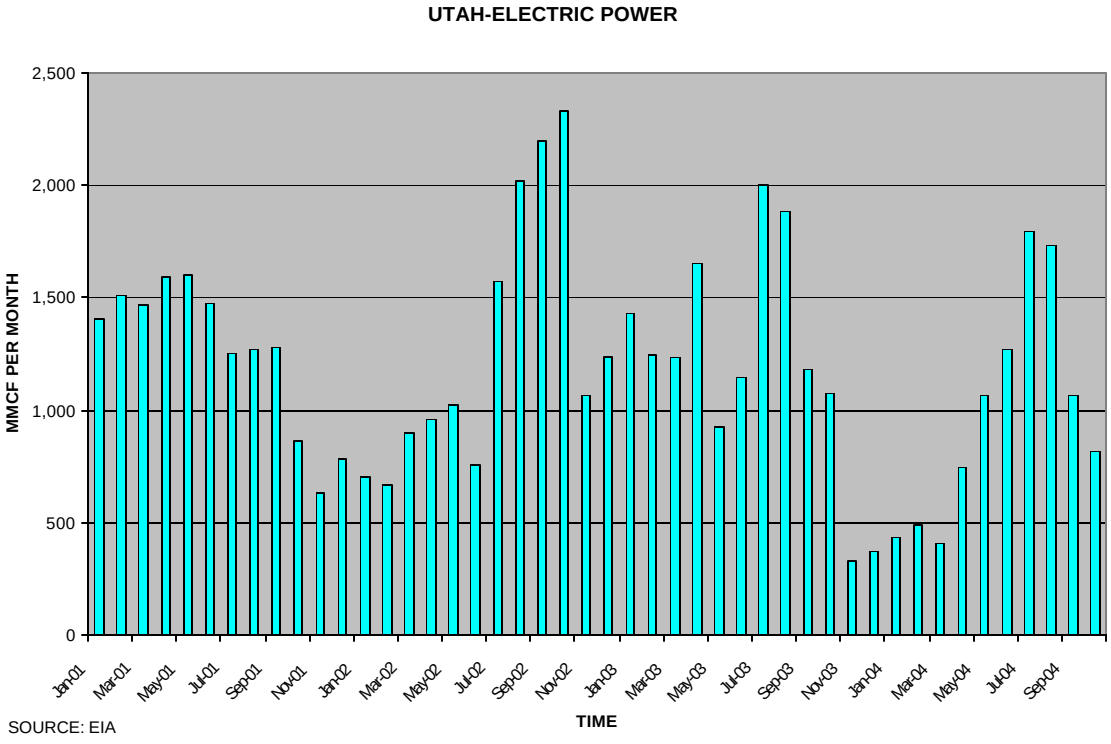


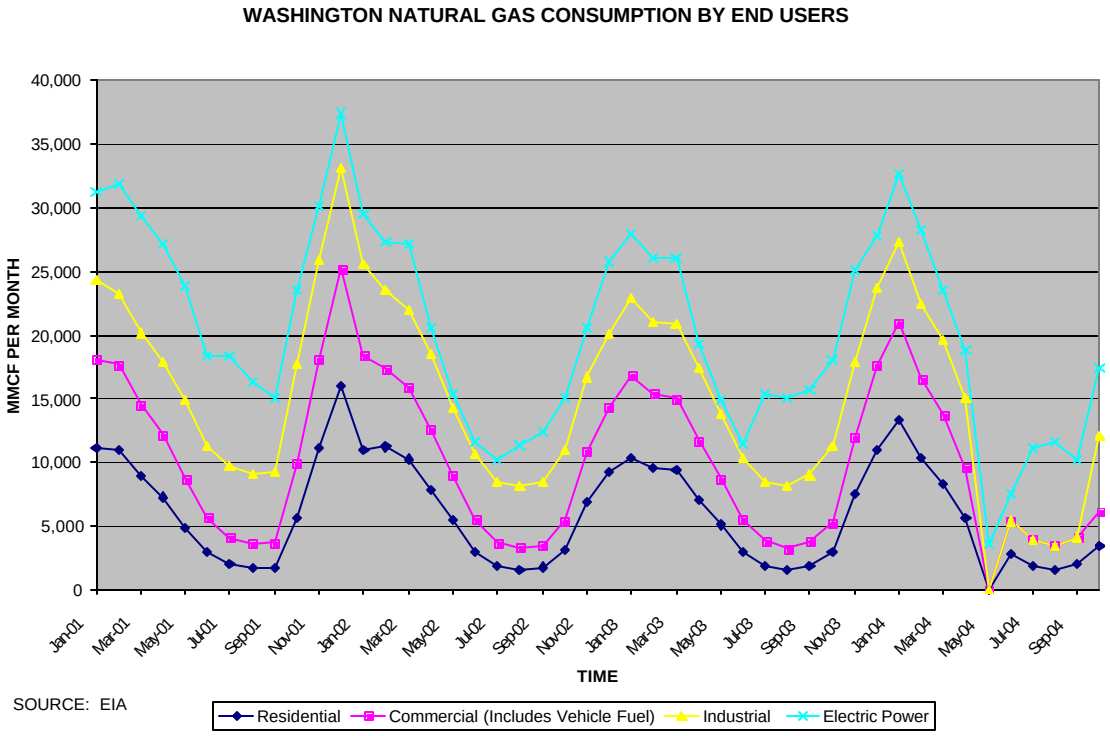
SOURCE: EIA

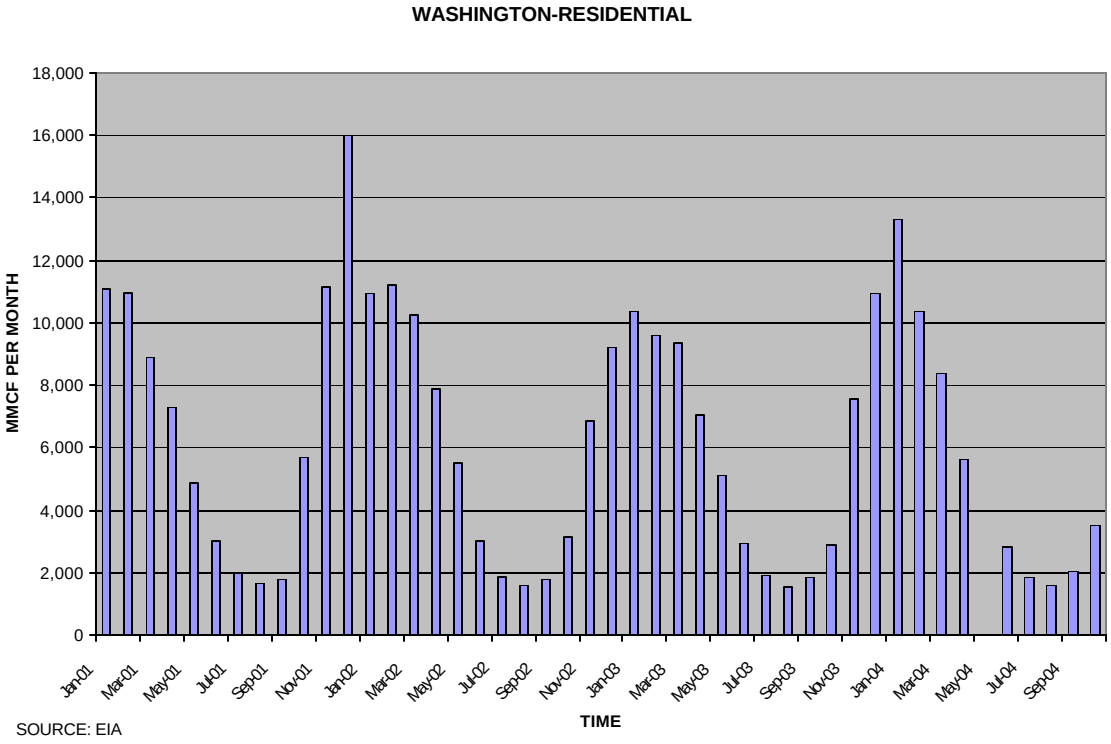
Washington – Consumption by End Use

In 2002, Washington's natural gas consumption was 227 billion cubic feet. Residential end use was 32.3 percent of the total. Natural gas demand by the commercial sector accounted for 20.5 percent of the consumption. The industrial and the electric generation sectors usage was 29.8 percent and 17.4 percent. The patterns of consumption were similar to those in Oregon in the residential, commercial, and industrial sectors.

Consumption in the residential and commercial sectors peaked during winter months and then declined to its lowest levels in the summer months. The pattern in the industrial sector was not as strong showing less of a swing in seasonal use in monthly consumptions compared to the residential and the commercial sectors. The electric generation sector exhibited no real discernable pattern of use.

Both the residential and the commercial sectors experienced growth rates of 4.3 percent and 1.0 percent per year, respectively. Historical data was not available to present growth/decline rates for the Industrial and the electric generation end uses.





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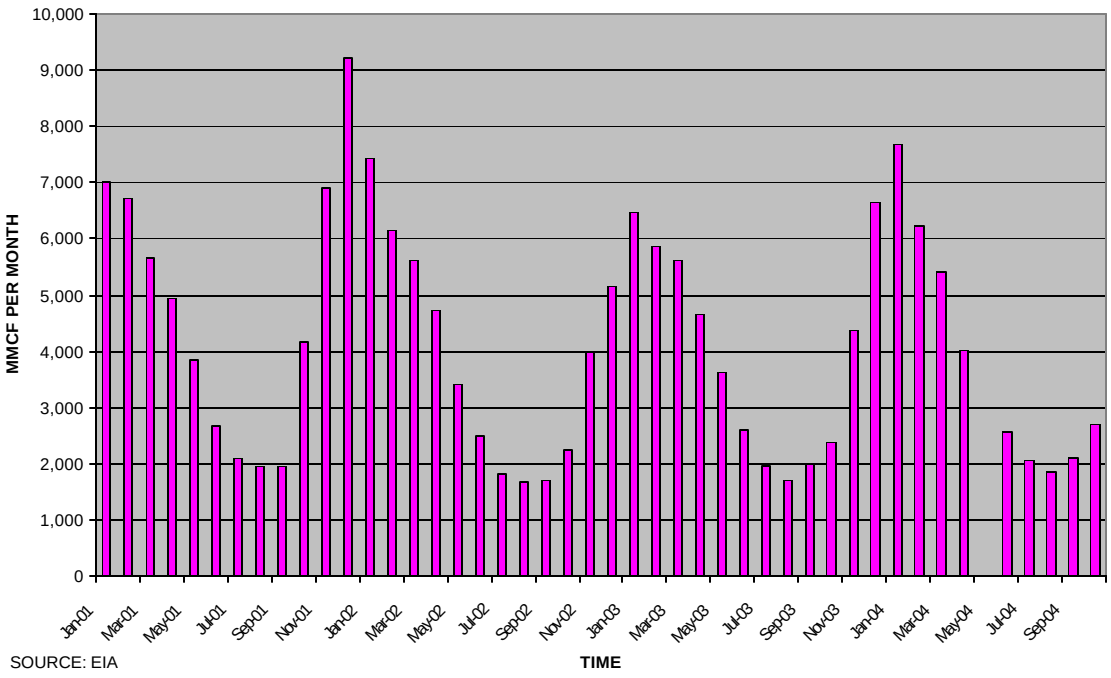

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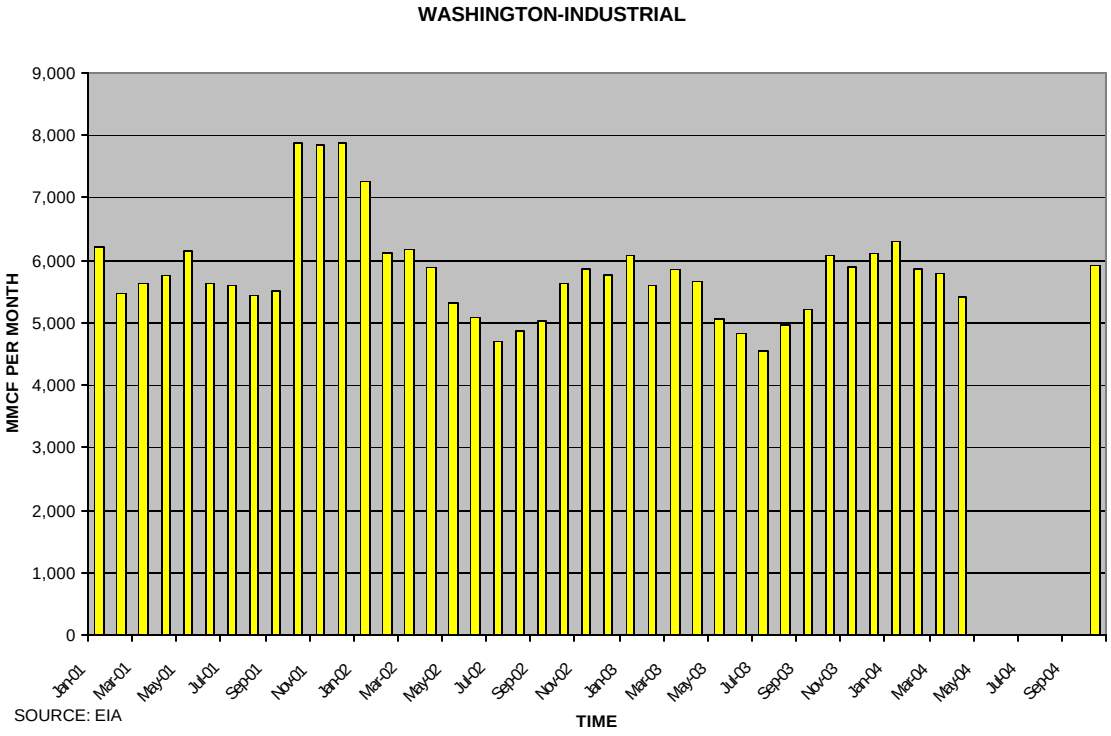

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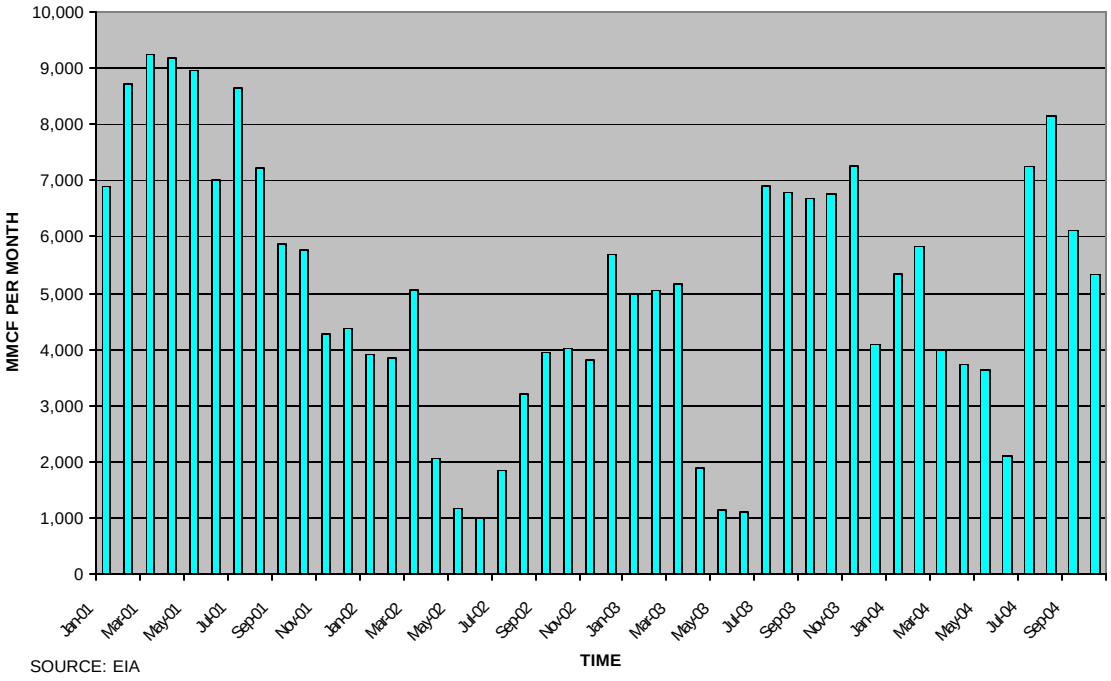


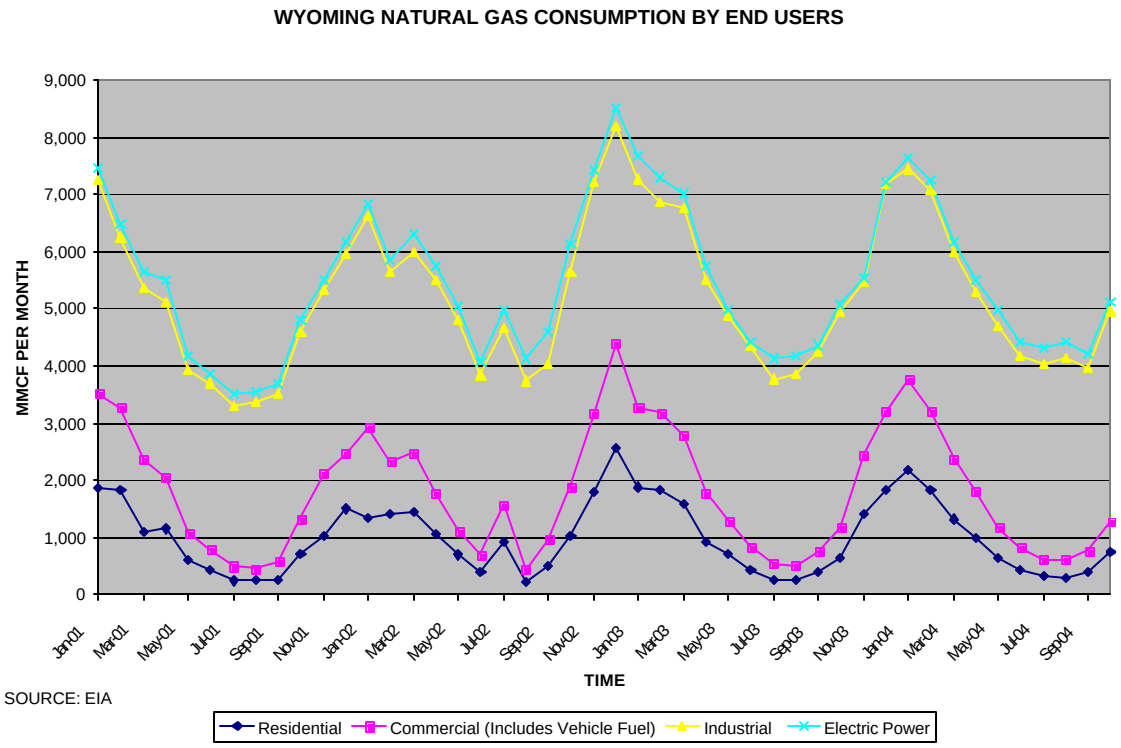
SOURCE: EIA

Wyoming – Consumption by End Use

In 2002, Wyoming used 70 billion cubic feet of natural gas. Approximately three quarters of this use took place in the commercial and the industrial sectors. The commercial sector accounted for 15.0 percent and the Industrial, for 60.5 percent. The residential sector accounted for 19.1 percent of the 2002 total and the electric generation sector for only 5.4 percent.

Similar patterns of consumption existed in the residential, commercial, and industrial sectors. Peak consumption occurred during winter months and troughs during summer months though with differing magnitudes. The electric generation showed no discernable pattern of consumption.

Growth rates for the sectors were quite similar. Residential end user consumption grew at the rate of 1.0 percent per year and the Commercial end users consumption grew at the rate of 1.2 percent per year. Insufficient historical data was available to calculate the growth rates for the remaining two sectors.



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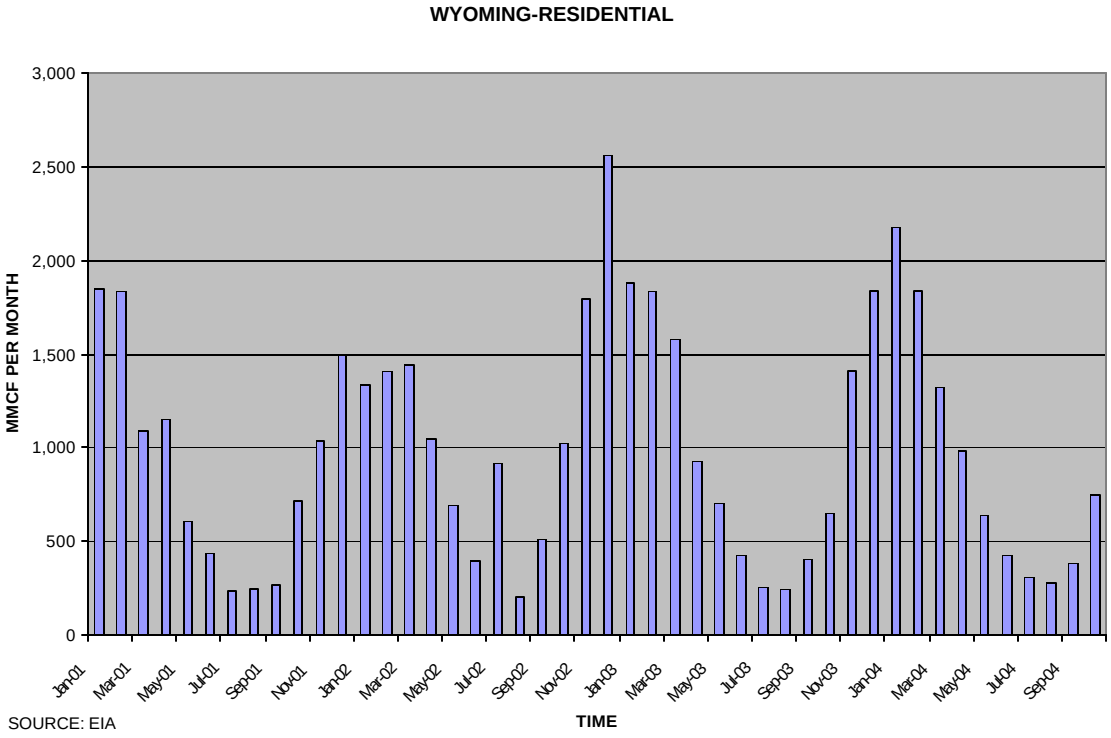

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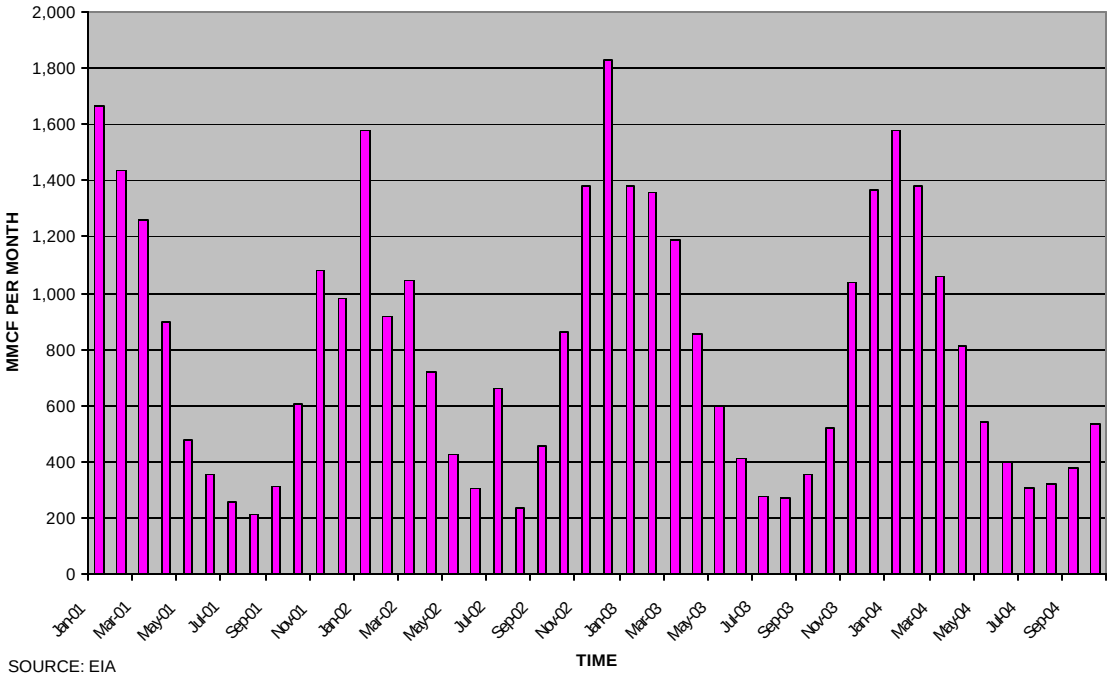

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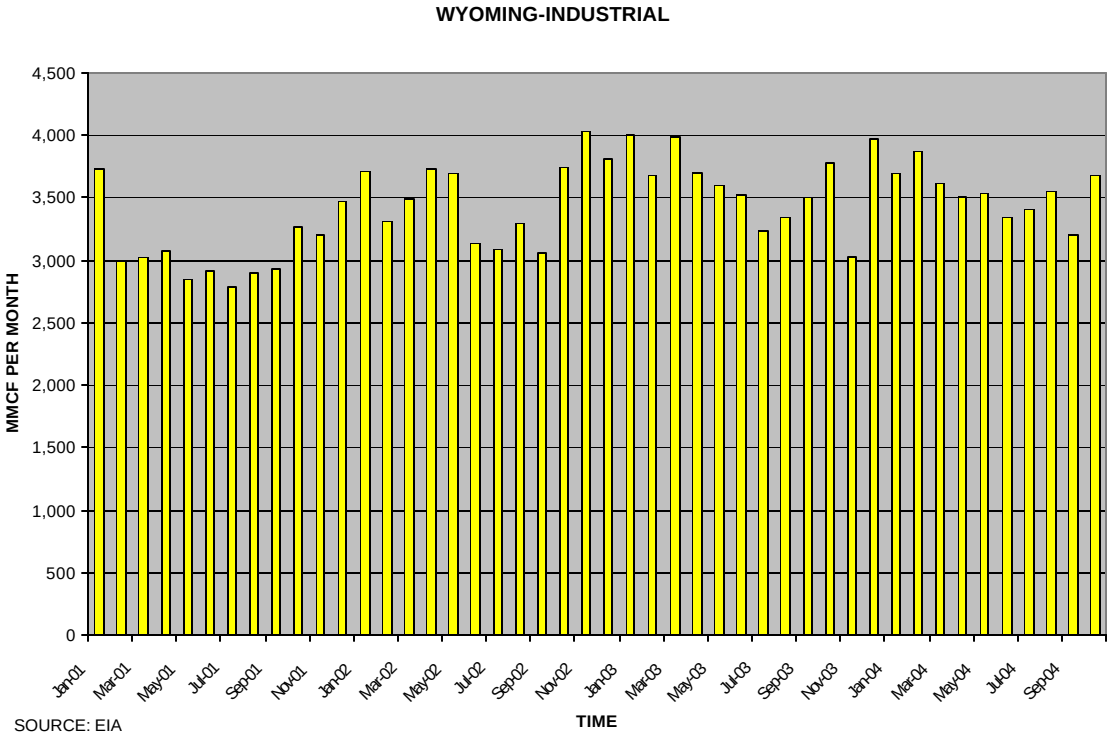

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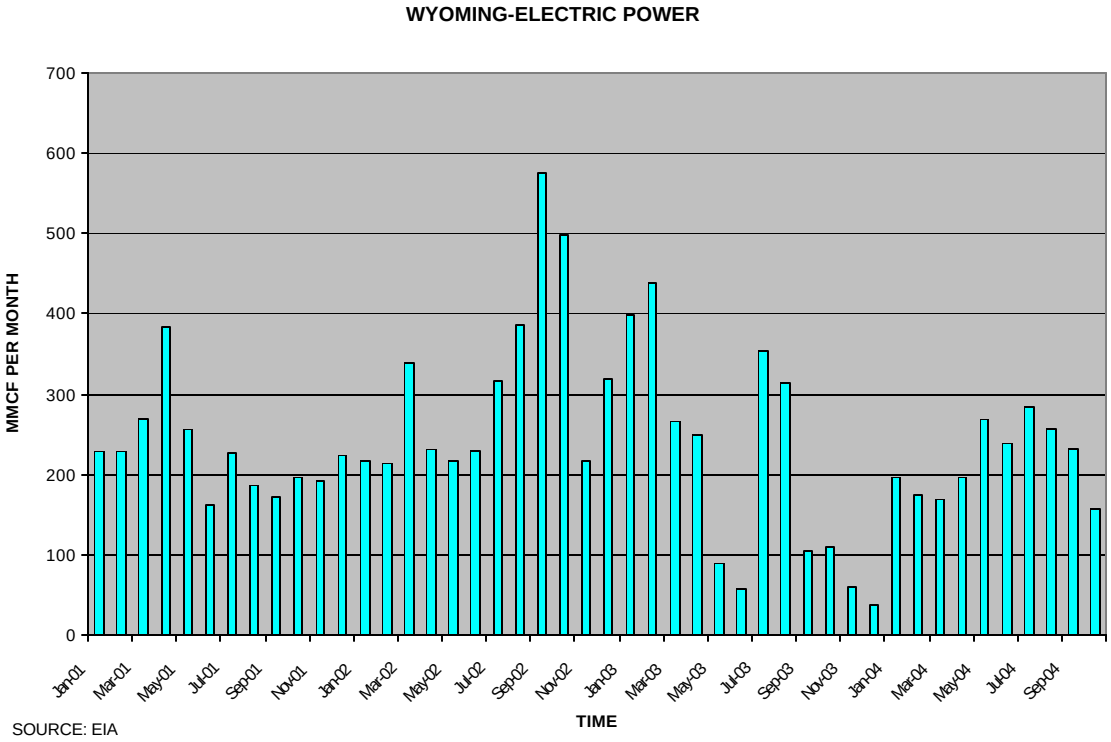


SOURCE: EIA

Electricity Production by Fuel Use

Electricity Production

The electricity production in 2002 for the WIEB states as a group was fairly balanced between coal, natural gas, nuclear, and hydro. The states generated 37 percent of the electricity from coal-fired plants, 21 percent from natural gas, 11 percent from nuclear, and 26 percent from hydro sources, **Table MC-3 Sources of Electricity Generation 2002**. The remaining 5 percent was generated using renewable and other energy sources.

Alberta and Saskatchewan generate the major portion of their electricity by natural gas. British Columbia major electric production is from hydro.

Table MC-3 Sources of Electricity Generation 2002, Percent

	Coal	Petroleum	Natural Gas	Other Gases	Nuclear	Hydroelectric	Other/ Renewables
North America	46	5	15		18	15	2
United States Western WIEB States	37	.04	21	.03	11	26	4
WIEB States							
ARIZONA	41	0	18	0	33	8	0
CALIFORNIA	1	1	49	1	19	17	13
COLORADO	78	0	20	0	0	2	0
IDAHO	1	0	3	0	0	90	6
MONTANA	60	2	0	0	0	38	0
NEBRASKA	63	0	2	0	32	3	0
NEW MEXICO	88	0	11	0	0	1	0
OREGON	88	0	17	0	0	73	2
NEVADA	51	0	38	0	0	7	4
UTAH	94	0	4	0	0	1	1
WASHINGTON	8	0	5	0	9	78	2
WYOMING	96	0	2	0	0	1	1
Canada							
Alberta		13	73			5	9
British Columbia		1	8			79	12
Saskatchewan		1	70			21	8

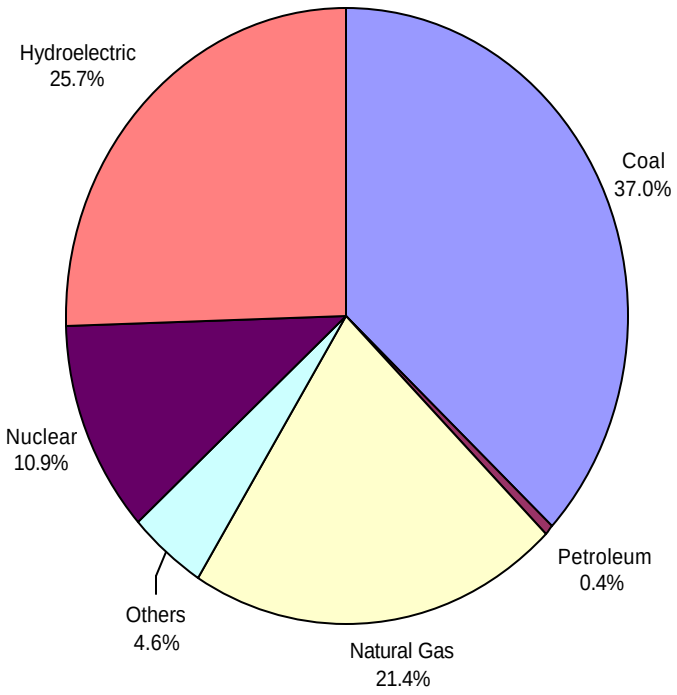
Source; Energy Information Administration

A review of electricity production from individual states indicates a much different outlook. Five of the Western states generate over 60 percent of their electricity from coal fired plants (Wyoming 96 percent, Utah 94 percent New Mexico 88 percent, Colorado 78 percent and Montana 60 percent). Three states had a significant portion of the electric generation from hydro (Idaho 90 percent, Oregon 73 percent, and Washington 76 percent). Nuclear generation makes up only 10 percent of the electric generation but it is concentrated in two states California where it accounted for 19 percent of the state's electric generation and Arizona at 33 percent. Natural gas was used to generate 21 percent of the

Western states' electricity. The major states using natural gas are California 49 percent, Nevada 38 percent, and Colorado and Arizona both at 19 percent.

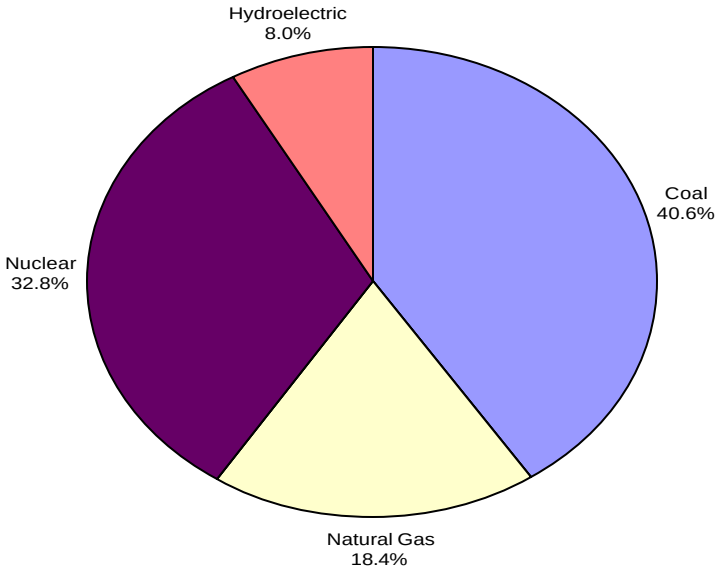
The accompanying pie charts indicate the primary fuel source for WIEB and the states electricity generation in 2002.

WESTERN REGION POWER GENERATION BY ENERGY SOURCE-2002



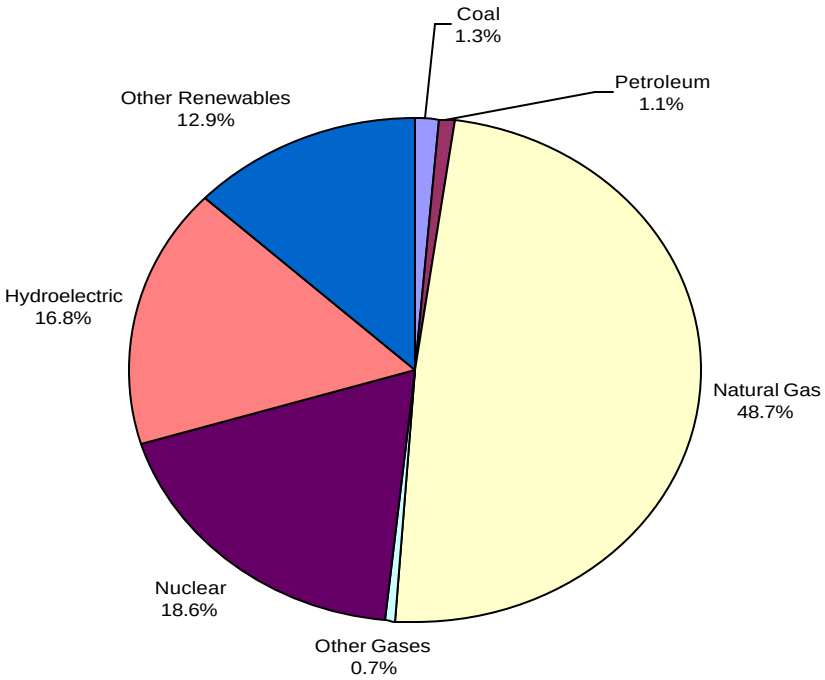
SOURCE: EIA

ARIZONA ELECTRIC GENERATION BY ENERGY SOURCE-2002



SOURCE: EIA

CALIFORNIA ELECTRIC GENERATION BY ENERGY SOURCE-2002



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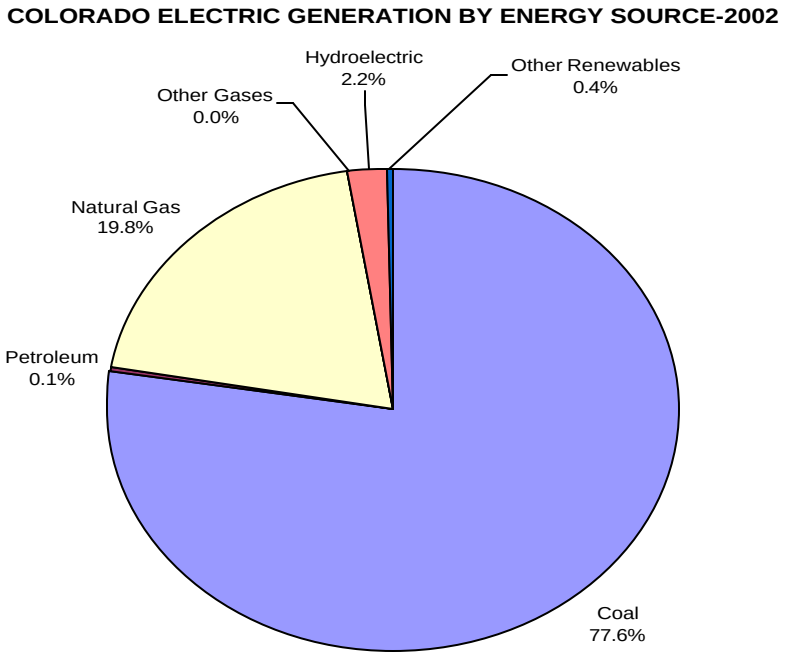

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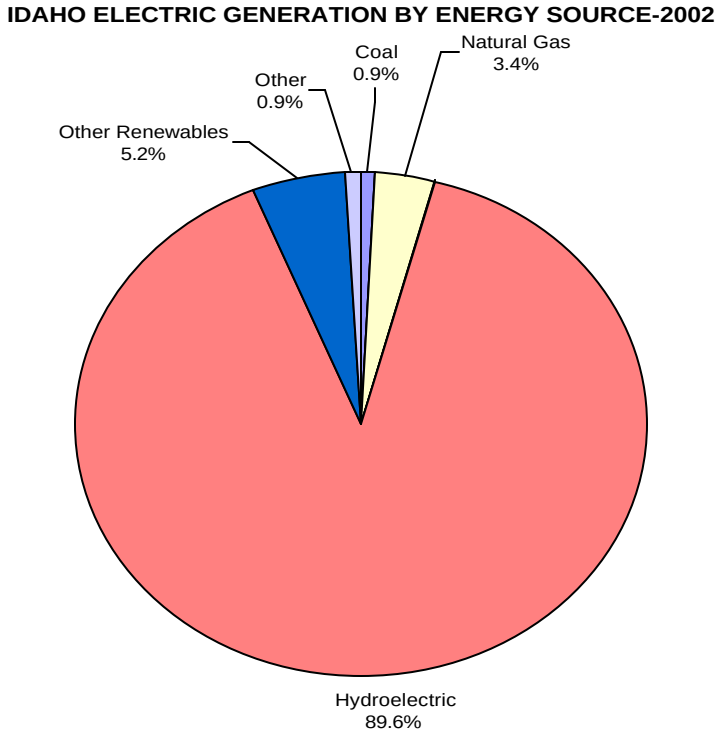
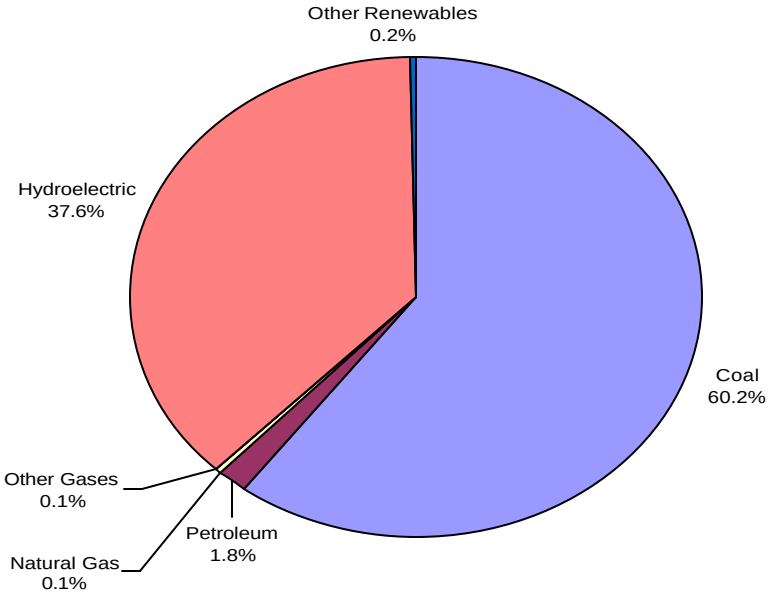


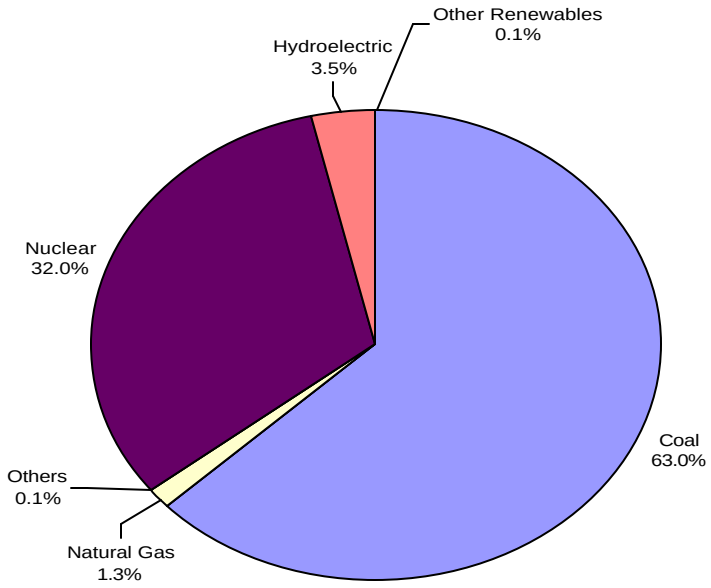
SOURCE: EIA

MONTANA ELECTRIC GENERATION BY ENERGY SOURCE-2002



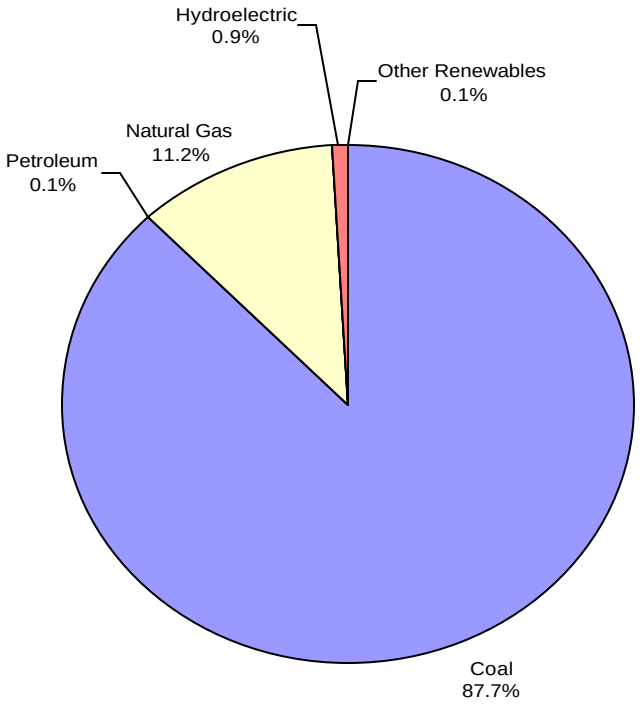
SOURCE: EIA

NEBRASKA ELECTRIC GENERATION BY ENERGY SOURCE-2002



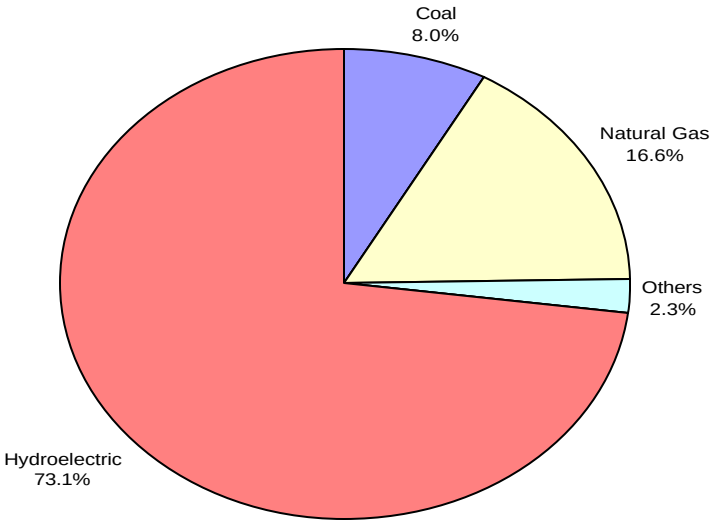
SOURCE: EIA

NEW MEXICO ELECTRIC GENERATION BY ENERGY SOURCE-2002



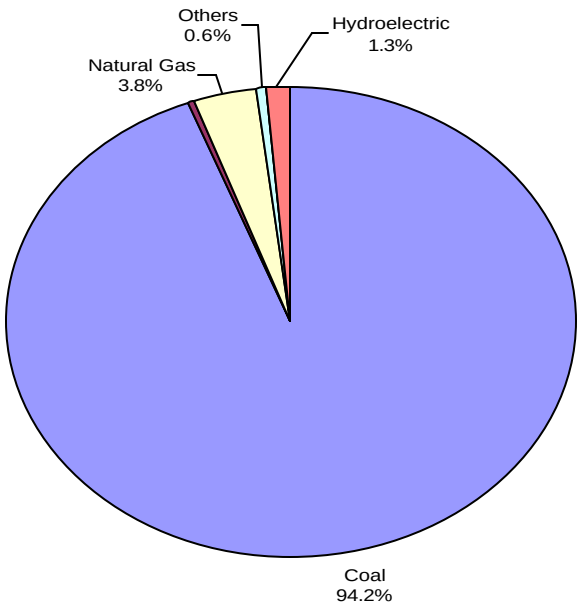
SOURCE: EIA

OREGON ELECTRIC GENERATION BY ENERGY SOURCE-2002



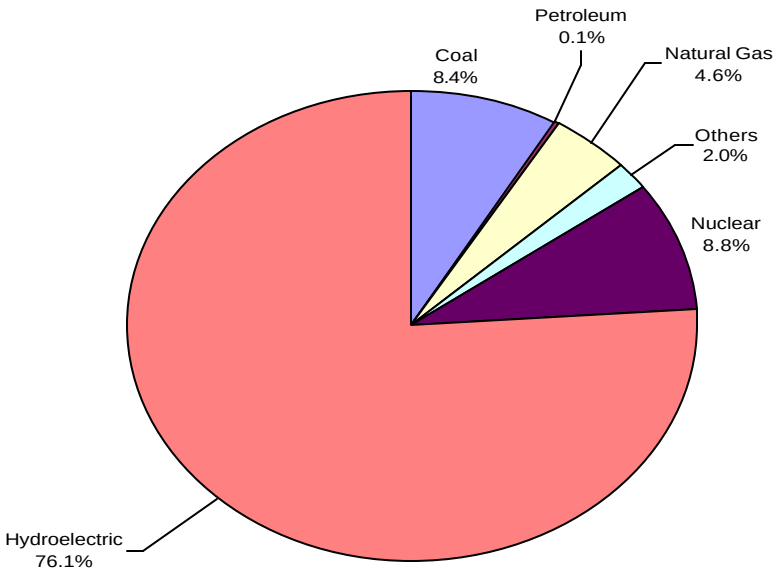
SOURCE: EIA

UTAH ELECTRIC GENERATION BY ENERGY SOURCE-2002



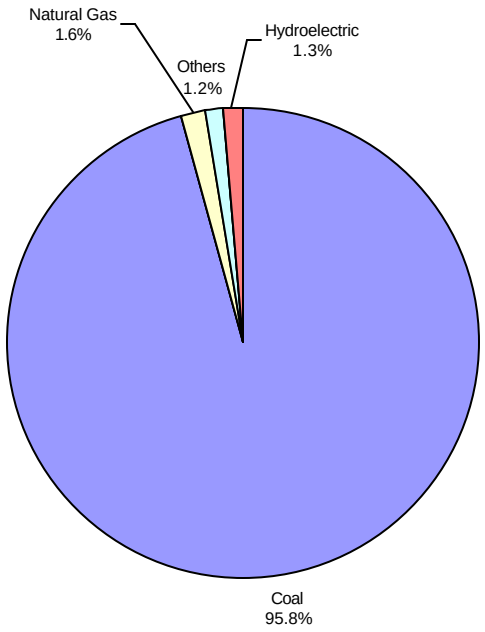
SOURCE: EIA

WASHINGTON ELECTIC GENERATION BY ENERGY SOURCE-2002



SOURCE: EIA

WYOMING ELECTRIC GENERATION BY ENERGY SOURCE-2002



SOURCE: EIA